

COMPUTERWORLD

IBM begins restructuring

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — As Vice President Quayle went on the stump last week to convince voters that the nation's financial slump "is not a George Bush recession," IBM apparently sized it up as a George Conrades recession and summarily stripped the head of U.S. operations of his duties.

Conrades' post — and, according to analysts, his place as one of the executives most likely to succeed Chairman John Akers — went to Robert LaBant, who pushed the Application System/400 workstation line into IBM's best-selling systems offering.

Conrades "has been benched," said Ulric Weil, president of Weil & Associates, a consulting firm in Washington, D.C.

While sources close to Conrades reported that the execu-



The replacement of George Conrades (left), IBM's head of U.S. operations, with AS/400 executive Robert LaBant kicks off the effort to push key decision-making into business units

tive was unhappy about his reassignment, the executive told *Computerworld* that he has no plans to leave IBM "in the foreseeable future." LaBant was un-

available for comment.

Within hours of the switch, IBM also released an embryonic blueprint for structural change,

Continued on page 121

Users hail frame relay for WAN traffic

BY JOANIE M. WEXLER
CW STAFF

Users bombarded with high-speed wide-area networking options have cast their votes for frame relay as the short-term winner.

The reason: Frame-relay service is available now from private equipment makers and several public carriers. This month, U.S. Sprint Communications Co.'s service will join those from Wiltel, CompuServe, Inc. and BT North America, Inc.

Last month, AT&T officially endorsed the technology with an announcement of a mid-1992 rollout that will parallel service available from MCI Communications Corp.

Users contend that frame-relay benefits are more apparent than those of Switched Multimegabit Data Service and Integrated Services Digital Network, slated to roll out en masse next year.

"We're looking at a commercial frame-relay service for locations not on our [private] corporate backbone," said Greg Hardison, a telecommunications supervisor at New Orleans-based metals company McDermott, Inc. "It's readily available and seems more stable than anything else out there."

Frame relay is an efficient form of packet switching. It offers a performance improvement of about 35% in a 10-node leased-line network, said Richard Malone, a

Continued on page 121



Michael Siggins

McDonald's reheats net management plan

BY ELISABETH HORWITT
CW STAFF

OAK BROOK, Ill. — McDonald's Corp. has joined the throng of corporations moving once-urgent integrated network man-

agement plans to the back burner in order to focus on managing specific, crucial areas of their networks, such as LANs.

McDonald's had hoped to put out a request for proposals this month for a corporatewide integrated network management system. The new system would monitor and troubleshoot everything from host platforms to local-area networks to wide-area transport networks, according to Michael Disabato, manager of the fast-food restaurant chain's network management design group.

The primary justification for the planned integrated management system was "holding down personnel and equipment costs," Disabato said. One console, instead of several, would be used to manage a variety of data communications equipment.

Another key element of the planned system was a consistent, easier-to-use interface that allows operations people — not just technical experts — to monitor the network, Disabato said. His group was also looking at automation software that

Continued on page 120

CW Chart: Janell Genovese

| Product | Score |
|-----------------------------|-------|
| Highest possible score: 100 | |
| Banyan's Vines | 85 |
| Novell's Netware | 83 |
| IBM's PC LAN | 77 |
| DEC's Pathworks | 76 |
| Microsoft's LAN Manager | 74 |

CW Chart: Janell Genovese

Object orientation next step for Novell

Licensing deal, equity stake to bolster development

BY JIM NASH
CW STAFF

PROVO, Utah — Novell, Inc., seeking to gain the high ground in object-oriented software, is undertaking a four-pronged initiative that could ultimately help network administrators better manage and enhance applications running over Netware networks.

Key to the strategy is Novell's plan to license its Internet Packet Exchange/Sequence

Packet Exchange protocol to Next, Inc. in Redwood City, Calif. Next would incorporate IPX/SPX into Version 3.0 of its Nextstep operating system, a heavily object-oriented environment, according to Kevin Wells, an operating system product manager at Next.

At least part of Novell's motivation for licensing the protocol is to expose users of its Netware network operating system to Nextstep's object orientation, Wells said. Novell declined to comment.

Nextstep Version 3.0 will ship in the first quarter of 1992, sources close to Next said.

The master plan

Novell's object-oriented attack extends beyond Next. It is reportedly investing in a fledgling object-oriented software development company, boosting its own development of object-oriented technology and leveraging existing industry relationships.

One possible motivator is the phalanx of competitors eager to bring object-oriented products to market. Chief among those threats are Microsoft Corp.,

Continued on page 121

INSIDE



Michael Abramson

Ronald J. Gidwitz, Helene Curtis' CEO, has a stake in computers, but he stresses that technology is only one element of his strategy. See The CEO View, Page 65.

IN THIS ISSUE

NEWS

4 Workstation vendors suffer an 8% slide in sales compared with last quarter.

6 SIM survey finds IS budgets decreasing and staffs' morale hitting bottom.

8 Firms that don't get vaccination shots of antivirus software are more likely than ever to be subject to infection, according to an NCSA study.

10 Word processor activity is on the rise as several firms announce shipments and price changes.

12 ALR hops on the price-slashing bandwagon by offering an Intel i486-based PC for less than \$2,000.

16 Users aren't breaking down doors to get a Posix-compliant version of HP's MPE/XL, although they admit it will be a helpful feature in the future.

18 Apple pursues the opportunity to sell Macintoshes as replacements for 3270 terminals.

119 Dads who are ordered by the court to pay child support will find it harder and harder to beat the system as more states implement automated programs to track the 'deadbeats' down.

120 Congress has passed a high-performance computer and communications bill to establish a national high-speed computer network.

Quotable

Some states are still operating out of shoe boxes with index cards."

GERALDINE JENSEN
ASSOCIATION FOR CHILDREN
FOR ENFORCEMENT OF
CHILD SUPPORT

*On the lack of automation
of some states'
child-support programs.
See story page 119.*

SYSTEMS & SOFTWARE

27 Germany's SAP AG customers are content to view its client/server-based R/3 line from afar.

PCs & WORKSTATIONS

39 Given the choice, software users at PC Expo '91 prefer reliable support over multiple features.

44 Technology Analysis: Wordperfect for Windows balances a graphical approach with traditionally rich Wordperfect functions. Reviewers say it has been worth the wait.

NETWORKING

55 In the wireless-network world, it will not be easy for users to make choices.

MANAGER'S JOURNAL

65 CEO Ronald J. Gidwitz shampoos information technology into Helene Curtis' business strategy.

COMPUTER INDUSTRY

99 There's a lot IBM could learn from its 6-month-old outsourcing subsidiary, ISSC.

PRODUCT SPOTLIGHT

75 LAN operating system packages may be inexpensive, but the cost to get them up and running can increase dramatically when all the requirements are considered.

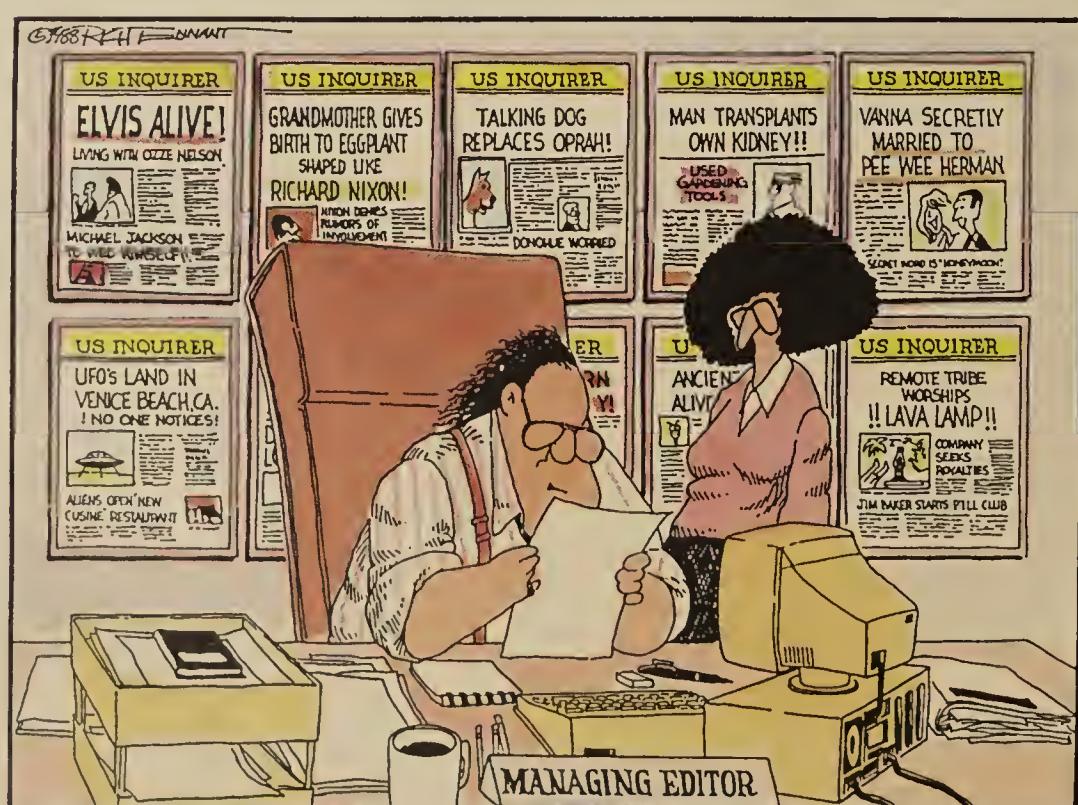
IN DEPTH

91 Seven steps to a successful business process redesign. By Louis Fried.

DEPARTMENTS

- 8, 120** News Shorts
22 Advanced Technology
24 Editorial
70 Calendar
105 Computer Careers
107 Industry Currents
113 Marketplace
118 Stocks
122 Inside Lines

The 5th Wave



"A STORY ABOUT A SOFTWARE COMPANY THAT SHIPS BUG-FREE PROGRAMS ON TIME, WITH TOLL-FREE SUPPORT AND FREE UPDATES? NAAAH - TOO WEIRD."

EXECUTIVE BRIEFING

■ Despite all the talk about business process redesign, IS chiefs have had little guidance in how to undertake such an effort. That's changing. Based on the experiences of pioneering companies such as Mutual Benefit Life and Ford, companies can analyze current processes as well as customer, management and user views on the organization to fashion a redesign plan that works. **Page 91.**

■ Gloomy results from a Society of Information Management survey show that companies are more interested in throwing dollars at hardware than in hiring humans. That's leading to lower expectations for career advancement among the 580 IS professionals surveyed. **Page 6.**

■ Integrated network management goes on the back burner at McDonald's, which has turned its attention to more immediate issues. The restaurant chain decided that getting its LAN plan together was more important for now. **Page 1.**

■ Software suppliers and users are speaking different languages. Vendor representatives on a recent panel discussing their plans were talking "Windows, Windows, Windows." Users listed their needs and answered, "Reliability, reliability, reliability." **Page 39.**

■ Superstores have their drawbacks in service, repairs and lack of certain major computer brand offerings, but IS professionals claim the savings are sometimes worth the inconveniences. **Page 113.**

■ Michael B. Emery, the man in line to replace Raymond E. Cairns as CIO at Du Pont, wants to do more than get IS talking to the business side. He plans to meld the IS organization right into his engineering operation. **Page 70.**

■ Most organizations have been hit by viruses, but few are doing much to prevent them, a new survey says. The primary source of infection: disks brought in from home. **Page 8.**

■ Now that IS has started to catch up to the marketing group and is providing more database support, expect the rules to change. Futurist Donald Libey says that information technology will have to play a key role in the industry in the next 10 years. **Page 70.**

■ DEC parts the curtain on the Alpha VAX, showing a 64-bit RISC-based system that runs Unix and VMS. But don't expect delivery for 18 months. **Page 4.**

■ Novell gets serious about object-oriented technology, cutting a deal with Next and buying into a small software firm. **Page 1.**

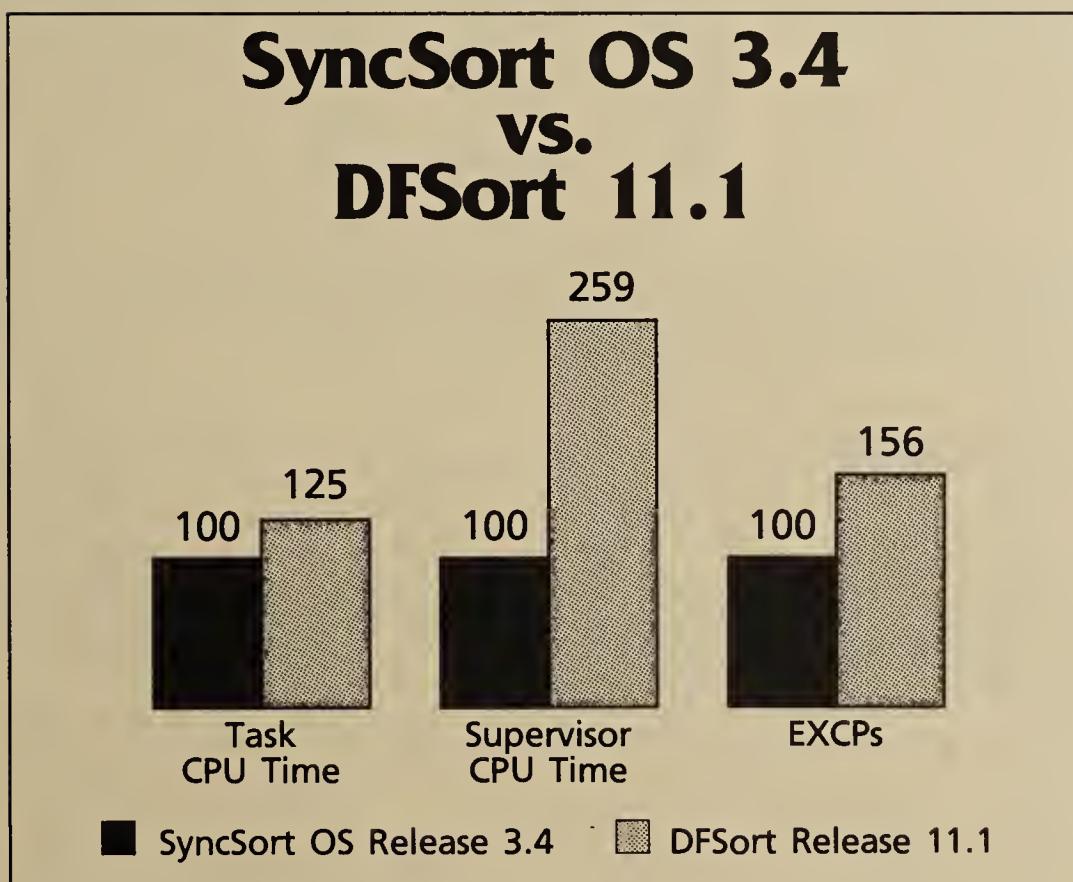
■ Customers of SAP AG don't seem to mind that their next generation of software is more than a year late. SAP changed directions midway through a rewrite, which is OK with users, who say they aren't quite ready for the new client/server-based software. **Page 27.**

■ The heralded S. C. Johnson system known as Proficere isn't dead. The human resources system got lost in the shuffle in Johnson's IS shake-up but has found a new home outside the company and is being offered on the open market by its designers. **Page 68.**

■ On site this week: The old system did the job, but it was as slow as molasses. So the state of Kansas went with a new imaging system that can turn around requests for birth certificates or other records in a day. **Page 29.** Don't call it downsizing; call it rightsizing. A Florida-based trucking firm goes from a mainframe operation to distributed Unix systems. **Page 33.**

■ San Joaquin Delta College developers build a Macintosh screen that presents an image of an entire office. **Page 39.** A government agency finds a way to cut out the waiting time for job applications and interviewers with a combined data and fax network. **Page 57.**

THE BEST KEEPS GETTING BETTER.



Best performance.
Best features.
Best value.

syncsort
INC.
50 Tice Blvd., Woodcliff Lake, NJ 07675
800-535-3355

Workstation shipments slide

Top vendors suffer decline in sales from recession, seasonal slowdowns

BY MARYFRAN JOHNSON
CW STAFF

SAN JOSE, Calif. — The top workstation vendors were left shivering in the chill of the season last week, as fiscal third-quarter shipment figures from Dataquest, Inc. revealed an overall 8% sales decline compared with the previous quarter.

The recession, seasonal sales slowdown and product transitions for vendors such as Digital Equipment Corp. and Sun Microsystems, Inc. carried most of the blame for the drop. Yet some users identified market saturation as another likely culprit.

"We might all have enough workstations, and now we're just trying to figure out how to make them work together," said Catherine Howells, manager of external standards at Boeing Computer Services in Seattle.

Only Hewlett-Packard Co. and Silicon Graphics, Inc. managed to buck the downward slide with modest increases in their shipments (see chart), while IBM, DEC, Sun and Intergraph

Corp. all tumbled backward. Overall, the leading workstation vendors moved 98,706 machines out the door in third-quarter 1991 — down from 107,134 the previous quarter.

"All the recent alliances may have also caused customers to pause in [determining] what platforms they're going with on future investments," said Laura Segervall, a workstation analyst at Dataquest. The market research firm expects workstation sales to rebound next quarter for the vendors, however.

High five

The five top-selling workstations in the third quarter were Sun's Sparcstation 2, HP's 9000 Model 425, Sun's Sparcstation IPC and Sparcstation IPX and IBM's RISC System/6000.

"HP is looking extremely strong on both sides of the picture now, with workstations and servers," Segervall said. "That's one challenge to Sun, which has always been really strong on the desktop but whose server volume has not had much

strength," he added.

HP's sales gains came from both its 400 series workstations and the new 700 series. "HP has had some supply problems with a shortage of [Texas Instruments, Inc.-supplied] floating-point chips for the 700 series, but that is starting to be resolved," Segervall said.

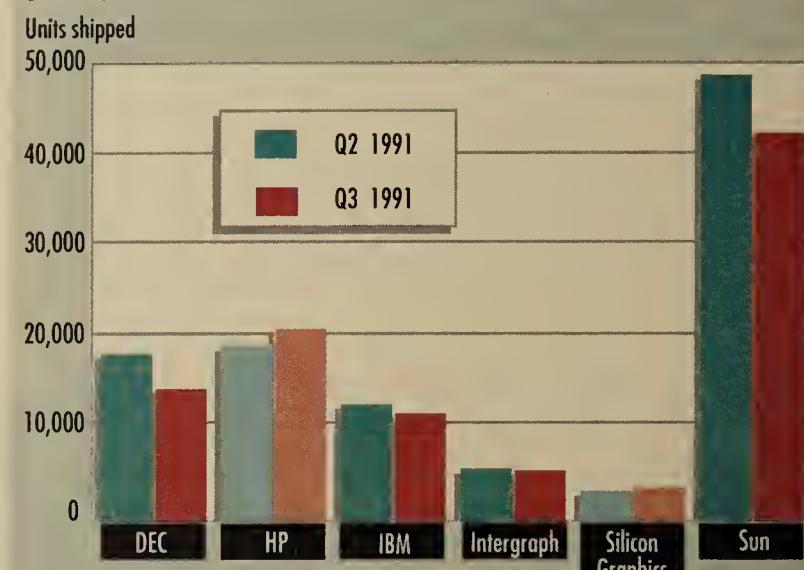
Silicon Graphics increased its numbers by dropping below the \$10,000 price barrier with its Iris Indigo workstations.

When IBM and HP break that same \$10,000 mark, which analysts said they expect will happen in early 1992, the workstation market will boil over once more — this time on the low end where Sun has held sway throughout the 1980s.

"Sun was definitely a leader in the conceptualization of what this market is," said Elvin Riley, an information systems vice president in the global banking division at Manufacturers Hanover Trust Co. in New York. But now the playing field is shifting, with HP, DEC and IBM as serious competitors, he added.

Desktop doldrums

Workstation shipments in the third quarter declined from the prior period for all vendors except HP and Silicon Graphics



Source: Dataquest, Inc.

CW Chart: Janell Genovese

ers Hanover avoided workstation purchases whenever personal computers would fit the bill. "The PC technology was cheaper and met our business needs, and the classic Unix workstation at the time was very pricey," Riley said.

Still, the bank is buying some new Decstation workstations to run specific trading applications, said Riley, one of three people responsible for merging the trading-floor operations of both banks.

Until recently, Manufactur-

ers Hanover avoided workstation purchases whenever personal computers would fit the bill. "The PC technology was cheaper and met our business needs, and the classic Unix workstation at the time was very pricey," Riley said.

That is changing now, however, as the bank's applications mature, the need for workstation capabilities expands and prices keep dropping.

Sybase comes through with customer support

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — It has taken close to a year, but Sybase, Inc. is finally responding to user complaints about customer support by adding three new programs.

The new services are visible signs of deeper investments in the firm's support organization, which some users have faulted

for uneven service levels. Many users have reported response times of days or weeks before specific software problems were resolved.

Following are the new support services, confirmed last week by Sybase executives:

- An electronic bulletin board. It will identify software bugs, operational problems and workarounds to sidestep the faults. The bulletin board, now in 20

beta-test sites, will be widely available in first-quarter 1992.

- A hard-copy troubleshooting guide. It will be widely distributed to Sybase sites in 1992, although delivery began this month. Another version is expected to be released by April.

- An increase of more than 20% in customer support personnel began this fall. However, Sybase declined to provide staffing figures.

"We believe that support is a very critical part of our business," said Valerie Anderson, vice president of customer service and support. "I made some promises, and I plan to keep them," she said.

The changes address a perception that fast-growing Sybase spent too little on customer support, analysts said.

"Sybase has had a persistent problem with customer satisfaction," said Peter Kastner, vice president at Aberdeen Group in Boston.

Users are aware that Sybase is strengthening its support efforts, but they said they are still waiting for the new programs to take effect. "So far, for us, their response time has been fairly slow," said Jan Beyen, manager of a small programming group at Shaw Data Services, Inc.'s Boston offices.

Meanwhile, Sybase is getting

credit for taking the right steps. "They appear to be doing the right things to beef up customer support," said Donald Feinberg, a senior software analyst at Gartner Group, Inc.

Some users would like to log on to the new bulletin board right away, if they could. "It would give us a way of looking for the workarounds for known bugs," said George Reid, director of MIS at Sanford C. Bernstein & Co., a New York investment house.

However, Reid noted that Sybase had provided good telephone support, sometimes even helping his programmers when it was 2 a.m. in New York.

DEC offers peek at 64-bit Alpha VAX

BY SALLY CUSACK
CW STAFF

NASHUA, N.H. — Digital Equipment Corp. opened the curtain just a crack last week on the inside workings of the company's Alpha VAX, revealing a 64-bit reduced instruction set computing (RISC) system capable of concurrently running OSF/1 and DEC's proprietary VMS operating system.

DEC is opening up VAX/VMS to stave off massive defections of users seeking safer, less costly and higher performance RISC platforms. The first Alpha systems are scheduled for delivery in the next 18 months.

Alpha will encompass desktop

to mainframe-class systems, and although DEC declined to specify availability and price/performance specifications, it is generally assumed that the first delivery will be in the workstation class of machine.

New York-based Bankers Trust Co., a large DEC VAX customer, is closely watching Alpha development before it commits to the architecture. "We're going to watch the progress with interest for the next year and a half," said Stanley M. Rose, vice president of technology strategic planning at Bankers Trust.

Adopting an Open Software Foundation (OSF)-compliant environment is exactly what DEC needs to do, according to Ira

McClain, director of information services at National Semiconductor Corp.'s Digital Logic Division in South Portland, Maine.

National Semiconductor just acquired a VAX 9000. McClain said, "There will be a place for both [Alpha VAX and VAX 9000] in the future, but eventually OSF/1 will dominate."

Alpha boxes will increase current performance scales by as much as 1,000 times over the next 25 years, according to Dick Sites, DEC's senior consulting engineer and Alpha co-architect. The RISC chip set currently clocks in at speeds of 200 MHz.

Sites said that while the Alpha architecture is unrelated to current VAX architecture, there

are a few features they "conveniently" share, such as 32-bit load and store instructions and VAX floating point in addition to the IEEE floating point functions.

DEC engineers also emphasized that the VMS operating system on Alpha will eventually have the ability to take full advantage of Alpha's 64-bit virtual address space.

The vendor is doing this in "evolutionary" development stages to maintain the compatibility of the existing 32-bit structures. Current VMS applications will run with minimum changes or recompile on the new systems, the vendor said.

Characterizing the pending Alpha products as "exciting," Michael Simmons, executive vice president at Bank of Boston

Corp., noted that the key for users is in installing the products and successfully executing applications.

"How fast will the software and applications catch up to the hardware? That is a real issue," Simmons said, referring to new applications developed for the Alpha architecture.

Peter Schay, vice president of midrange computing strategies at Gartner Group, Inc., a Stamford, Conn.-based research and consulting firm, concurred that one of DEC's challenges from both a user migration standpoint and a technical point of view is VMS on Alpha.

"Alpha is going to live or die based on how seamlessly the translation from a VAX object program to an Alpha object program will work," Schay said.



ORACLE SERVER FOR NETWARE WENT TO SARA LEE AND HAD THE COMPETITION FOR DESSERT.

"ORACLE SERVER NLM TAKES
TOP HONORS FOR SPEED,
RELIABILITY AND ROBUSTNESS"

Sara Lee Corp. and PC Week Labs.

"The project at Sara Lee was ambitious. The original database application that the company wanted to downsize to the client/server platform was a subset of its order-entry records..."

"In the end, ORACLE Server [for NetWare] was the only software that met all the stringent requirements for the application..."

"While each product competing in the shootout displayed strength in one area or another, ORACLE Server was at or near

the top in nearly every competition.

"ORACLE Server's performance shined on database queries that required complex aggregations—sometimes more than twice as fast as other products..."

"In selecting ORACLE Server as the winner, the judges considered other factors such as product maturity and experience with corporate databases, and the selection of front-end tools to access the database."

"(And) even though the NLM version of ORACLE Server was new, it was considered to be a close extension of the firm's OS/2 and Unix products, which are proven technology on client/server platforms."

—PC Week June 24, 1991

Hungry for more? ORACLE Server for NetWare just recorded the highest audited TPC Benchmark™ B rate ever on a PC—43 tpsB. At that rate, the low \$2590/tpsB is just icing on the cake.

1-800-633-1071 Ext. 8145

Call us for a complete benchmark report and reprint of the PC Week Shootout. We'll also tell you more about the rest of Oracle's open family of portable software. And the support, education and consulting services that help you get the most out of your investment.

ORACLE®

Software that runs on all your computers.

IS spends more on machines, hires less

BY CLINTON WILDER
CW STAFF

CHICAGO — Despite all the hype about empowered knowledge workers being the true strategic assets, information systems departments' spending on machines is increasing faster than staffing levels, and it is having an impact on morale.

That is the bottom line, according to a recent Society for Information Management (SIM) survey of 580 IS professionals. It found that overall, IS capital expenses are increasing at more than twice the rate of IS staffs, and staffs are actually shrinking at the largest companies. It also appears that funding for both capital expenses and staffing increases is being kept to a minimum.

Among the companies surveyed, IS staffs are expected to increase this year by an average of 2%, while capital expenses are budgeted to increase by 5%. Among companies with IS bud-

gets exceeding \$100 million, however, staff size will actually decrease by an average of 0.6%, while capital spending increases by 2.2%.

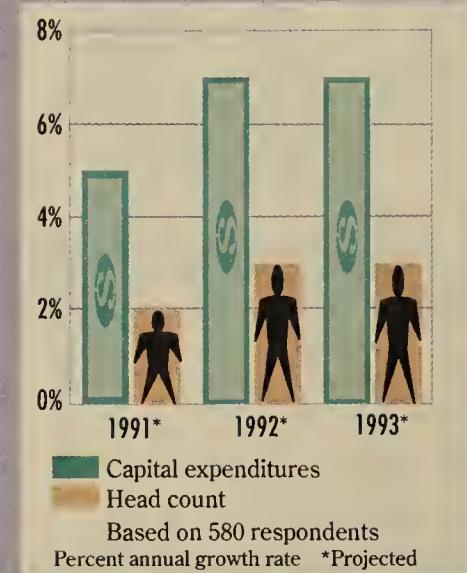
The recessionary times appear to be taking a mental toll as well. Compared with a similar SIM survey in 1989, the number of respondents who said they expect to reach unmet career goals in their current organizations plummeted by 19%. IS job satisfaction also decreased slightly.

Of respondents who have not yet achieved their career goals in IS, only 36% felt they were likely to do so at their present firms — down significantly from 55% two years ago. Overall, while a respectable 79% said they were satisfied with their IS careers, that figure was down from 85% in 1989.

SIM board member and survey head Ed Mills acknowledged that the satisfaction results may have even been skewed toward the positive because SIM members who responded were likely

Machines persevere

Despite the recession, IS capital expenditures are increasing at twice the rate of IS staff



those in stable positions. "Those no longer in a position were probably not particularly interested in filling out a survey," said

Mills, vice president of systems and operations at the U.S. Committee for Unicef in New York.

To see how volatile life has been for IS executives, one need look no further than the SIM leadership. The last three presidents of the association — John Owens, Laurance Burden and John Hammitt — have each experienced job changes in the past 15 months.

The money trail

Although capital costs for hardware have declined, spending for telecommunications has picked up the slack. The survey also

found increased spending on automation technologies that can cut staff, such as computer-aided software engineering, ac-

cording to Mills.

Client/server computing earned by far the highest interest among emerging technologies. Respondents were asked to rate technologies for significance on a scale of one to four, and client/server computing scored 3.2, far ahead of second-place finisher electronic data interchange at 2.85.

The interest in client/server jibes with the trend toward smaller IS staffs, Mills said. "Some of what used to be the IS staff is now in user departments in many cases," he said. "This is one technology that cuts across both functions."

Reshaping business processes was the most popular management trend, with an average significance rating of 3.31 out of a possible four. Quality improvement was second at 3.19, and IS/business partnerships was third at 3.01. Measuring the value of IS was low at 2.56.

The survey also found that 58% of the companies responding have companywide quality programs in place, although the preponderance of such programs varied widely among industries.

DRI promises free fix for problems with DR DOS 6.0

BY CHRISTOPHER LINDQUIST
CW STAFF

MONTEREY, Calif. — Digital Research, Inc. (DRI) confirmed last week that some problems exist with the latest version of the DR DOS operating system and that a free fix should be available by year's end.

Among the problems reported with DR DOS Version 6.0 are incompatibilities with Novell, Inc.'s Netware Lite, problems with the installation of Wordperfect Corp.'s namesake word processor and Microsoft Corp.'s Windows 3.0 and performance degradation when using the Undelete feature.

Some users also reported losing data after exiting Windows while running DR DOS 6.0, but DRI said it has not been able to confirm the problem.

Interestingly, after the unveiling of Microsoft's DOS 5.0 in June, DRI President Dick Williams insisted that DR DOS was "more compatible with Windows" than MS-DOS.

Reports of DR DOS Version 6.0 bugs came to light on public bulletin boards and networks such as Compuserve. In addition, users complained of slow upgrade shipments and problems getting through to technical support representatives.

DRI's forthcoming fix will be available free to all registered DR DOS 6.0 users, a DRI spokeswoman said. DRI will also disseminate information on how

to configure available features to avoid problems, as part of a so-called "business update."

"We're finding that people need a little more hand-holding than they needed with DR DOS 5.0," she said.

The spokeswoman also acknowledged a conflict between Netware Lite, DR DOS 6.0 and the Superstor disk compression utility when a system is used as a server. Novell, which recently purchased DRI, shipped 8,000 copies of DR DOS 6.0 with the first units of Netware Lite.

In addition, the spokeswoman claimed, demand for DR DOS 6.0 has slowed DRI's ability to send updates to registered users, although steps are being taken to alleviate the bottleneck.

More than 225,000 copies of DR DOS 6.0 have shipped worldwide since its release on Sept. 9, according to DRI. This compares with MS-DOS 5.0 upgrade sales of 2 million, along with the 4 million to 5 million new copies of the operating system that were shipped with new hardware, said Brad Chase, DOS product manager at Microsoft.

Michael Martell, an information center specialist at a large New England insurance company, tried DR DOS 5.1 and set up a system with Version 6.0 but gave up on both. Martell said he found the product too unstable running on networks and under Windows to be trusted. "For us, DR DOS is not a viable alternative," he explained.

Vines users seek routing alternatives

BY JOANIE M. WEXLER
CW STAFF

Growing Banyan Systems, Inc. Vines shops are facing a deficit of efficient internetworking alternatives. Those with mixed-vendor environments have installed jury-rigged setups that often require a separate network for Vines traffic.

As large users of local-area network internetworks, Vines customers are among the most eager to shift from bridging to routing schemes. Today, however, those running multiple protocols have just one router supplier choice: Cisco Systems, Inc.

Vines servers will route Vines IP — Banyan's twist on the Xerox Network Systems communications protocol — with no extra equipment, noted Frank Hiatt, Banyan's product manager of protocols and interfaces.

Banyan also provides a \$1,995 Vines option for encapsulating Vines IP in standard Transmission Control Protocol/Internet Protocol (TCP/IP) packets or vice versa, he said, so users can run a Vines or TCP/IP backbone. But this may have problems.

John Scoggin, supervisor of network operations at Vines shop Delmarva Power & Light Co. in Newark, Del., uses the encapsulation option. But he said that his Vines servers often cannot communicate and that encapsulation bogs down performance. "We're waiting with bated breath" for Delmarva supplier Wellfleet Communications, Inc. to route Vines, he said.

Wellfleet and Proteon, Inc. are both at work to challenge Cisco with Vines routing support. Proteon went into beta testing this month and expects Vines support to ship on its routers in early 1992, said Richard Lush, Proteon director of inter-

while bridges are protocol-independent and can thus easily form a mixed-protocol backbone, users cannot partition their internetworks or create alternate routing paths with them.

"Most Vines users are encapsulating Vines traffic within IP,

Vines internetworking options today

- Bridge Vines with all other traffic. Alternatives here include either a source-route bridge for Token Ring environments, a transparent bridge for Ethernet environments or translation (source-route-transparent) bridge for a mix of the two.
- Bridge Vines and route all other routable traffic through a multiprotocol router backbone.
- Route both native Vines and all other routable traffic through Cisco Systems router backbone.
- Overlay a separate wide-area network for Vines traffic using Banyan's server-to-server routing option, and route all other protocols through a multiprotocol router.

networking product marketing.

Banyan has also licensed code to Wellfleet, which said it will route Vines by mid-1992.

Some Vines users cannot wait. Demetrios Karadimas, technical consultant at Chemical Bank Corp. in New York, said he began Cisco trials last month because his patchwork of bridging schemes and Vines server-to-server routing was inefficient.

"We're looking to replace all bridges with intelligent routers," he said. "Vines tends to do a lot of broadcasting because of Streettalk [Banyan's widely heralded directory service]."

Broadcast storms are one drawback to bridging. Also,

though they're not thrilled with it," observed Jim Harrison, a networking program director at Meta Group, Inc., a Westport, Conn., consultancy.

Frito-Lay, Inc. in Dallas uses a combination of IBM bridges and Vines server-to-server routing software and is moving to Cisco because of its Vines support. The firm has a mixed Vines/IBM LAN Server environment. In the wide area, "Banyan can't carry Netbios," an IBM networking protocol, so the company runs separate Netbios and Vines bridge networks, said Jack Sprague, a systems analyst. He said Cisco routers will meld those separate links.

A recent study of over 4,000 Datamation Magazine subscribers named Oracle Financials as the accounting software they are most likely to buy this year. Which isn't too surprising, when you consider everything they have to offer.

Oracle Financials are the first complete and integrated family of cross-industry accounting software based on modern relational technology. In other words, the modern alternative to the ineffective, unresponsive accounting software built in the 1970's.

Whether you're a growing enterprise or a giant conglomerate, Oracle Financials can be quickly configured to do business the way you want. Then altered or extended as your needs change. All without programming.

Oracle Financials are powerful enough to do large-scale, multi-national, decentralized accounting. So large companies can use them in all their international and domestic divisions, subsidiaries and departments. Which means everybody gets the information they need, when they need it. Even headquarters.

Oracle Financials are the first major accounting software with 1-2-3 and Macintosh-like menus. To give your users unprecedented ease of use.

Like all Oracle products, Oracle Financials run on virtually any computer you have today, or will have tomorrow. On mainframes or low cost mini-computers, workstations and PCs. So you can use the computer or group of computers that makes the most sense for your company and your budget.

But more than just software, Oracle provides the education, consulting and support services to maximize your success with Oracle technology. In fact, over one-third of the 8,000 people at Oracle are devoted to customer service.

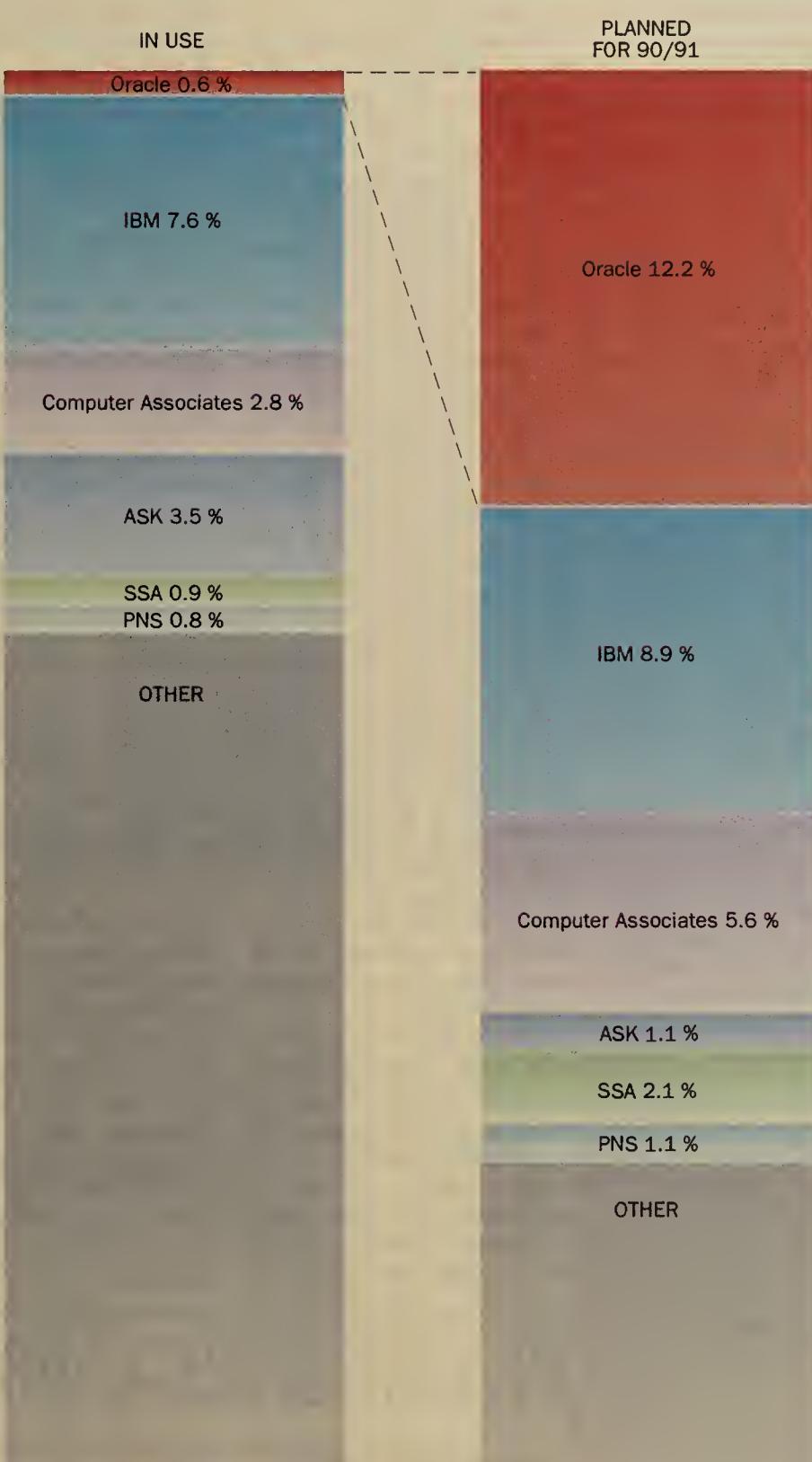
Call us, and register for the free Oracle Financials Seminar in your area.

1-800-633-1073 Ext-8120

You'll see why Oracle is accounting for all the growth in accounting.

ORACLE®

Software that runs on all your computers.



Brands cited when 4,062 Datamation Magazine subscribers were asked "Do you have in use now, or do you plan to use initially in 1990/91, Financial/Accounting software with your minicomputer/workstation system?*

NEWS SHORTS

One bright spot for jobless

Polaris Service in Hudson, Mass., is offering training for unemployed computer maintenance professionals. The training will focus on the care and feeding of Sun Microsystems, Inc. workstations. Polaris, an independent maintenance company specializing in Sun equipment, will offer a pilot training program to unemployed members of the Massachusetts chapters of the Association For Service Management International (AFSMI). Individuals who qualify can take a scheduled systems administration or hardware maintenance course for a nominal tuition fee. For more information, contact Jean Doynow in the AFSMI public relations office at (212) 840-6570.

Officevision to turn 'Red'

IBM said it will keep its promise to provide support for Novell, Inc.'s Netware in an Officevision environment by year's end. The support covers Netware/286 Level 2.2 and Netware/386 Level 3.11. IBM committed to Netware support in June, when it provided its last Officevision update. At that time, it also committed to Microsoft Corp.'s Windows 3.0 support. It followed through on the Windows promise with an announcement late last month.

NASD bets big on Unix integrator

ERI, a systems integrator specializing in Unix-based connectivity, said last week it had received a \$2 million contract from the National Association of Securities Dealers (NASD). The agreement is to load, test and deliver hardware and software for NASD's certification system, which is used to qualify registered securities brokers. ERI will install a Unix-based operating system and a relational database system on Sun workstations. The certification software is slated to be completed by year's end and will be followed by a pilot test program in the first quarter of 1992, ERI said.

Storage Tek weds XL/Datacomp

Disk drive maker Storage Technology, Inc. announced that its proposed merger with Hinsdale, Ill.-based XL/Datacomp, Inc. was approved last week by XL/Datacomp's board of directors. Stockholders will be able to exchange each share of XL/Datacomp for 0.2675 of a share of Storage Tek. A request by a lone XL/Datacomp shareholder to stop the merger was denied by an Illinois judge. Louisville, Colo.-based Storage Tek, which makes storage and retrieval systems for midrange systems, said XL/Datacomp will provide a strong point of entry into the IBM Application System/400 market. XL/Datacomp distributes and services AS/400s.

How green is the Valley?

With the holidays coming up, perhaps Silicon Valley was struck with the green spirit. Last week, Intel Corp. said it was cutting out ozone-shredding chlorofluorocarbon (CFC) use in systems manufacturing by the end of the year. Systems manufacturing accounts for one-third of Intel's total CFC use. Hewlett-Packard Co., meanwhile, announced it had changed its shipping cartons to nonbleached cardboard and switched its shipping packaging to recycled polystyrene foam.

1-2-3 cash back, freebies offered

Lotus Development Corp. launched a holiday season promotion that will give customers a bonus package of complementary software and cash rebates when they purchase 1-2-3 for DOS or an upgrade through resellers. The bonus package includes several products: SQZ, a spreadsheet file compression utility; Outliner, which creates spreadsheet summaries; seven customized templates; and Smartpics, a set of color clip-art images. It also includes three small cash rebates, ranging from \$5 to \$20. Separately, Lotus shipped the network edition of 1-2-3 for Windows and named CC:Mail co-founder Ed Owens as director of work-group applications and connectivity products for CC:Mail at Lotus.

More news shorts on page 120

Despite disasters, PC users spurn antivirus inoculations

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — Large corporations and government agencies in North America are more likely than ever to have their IBM Personal Computers or compatibles knocked out by computer viruses, but few are using antivirus software to help combat the problem, according to a recent survey.

The National Computer Security Association (NCSA), which sponsored the study, and Dataquest, Inc., which carried out the research, released details of the survey last week at the First Annual Anti-Virus Product Developers Conference held here.

The study, which queried 600 organizations that have at least 300 PCs, revealed that 63% had had an "encounter" with at least one computer virus in their PCs, and 9% had experienced virus "disasters" affecting 25 or more PCs. The primary source of infection is disks brought from home, according to 43% of the respondents; 62% said a loss of productivity was the primary effect on PC users.

The number of virus encounters and disasters has risen steadily since the first quarter of this year, according to the study. Virus encounters climbed from 19% to 40% of those surveyed; virus disasters climbed from 2% to 6% of those surveyed.

"Clearly, we are seeing an increase in the overall problem," said Sheila Cotter, director of consulting at Dataquest. With the continuing popularity of local-area networks, the number of virus disasters can be expected to increase because networks make it easier for viruses to



They're everywhere!

Of the 600 respondents surveyed, 63% have experienced a computer virus encounter. Viruses have caused a variety of ailments:

| | |
|---------------------------|-----|
| Loss of productivity | 62% |
| Screen message and lockup | 41% |
| Corrupted files | 38% |
| Lost data | 30% |
| Unreliable applications | 24% |
| System crash | 23% |
| Loss of confidence | 20% |

Percentage of respondents. Base: 600
Multiple responses allowed



Source: Dataquest, Inc.

CW Chart: Tom Monahan

spread, Cotter added.

Also, the number of known viruses has reached about 1,000 and is increasing at the rate of two or three per day, said David Stang, research director at NCSA.

Eighty-six percent of organizations that experienced a disaster took less than five days to eradicate the virus, at an average cost of \$6,258 per incident.

But the average cost figure may be as much as 10 times higher, said Peter Tippett, president of Certus International Corp., one of six antivirus software developers who funded the study.

Furthermore, 41% of the survey respondents were people identified as "virus troubleshooters" who had technical, rather than managerial, responsibilities at their firms.

They probably underestimated the actual cost in lost computer resources and manpower to combat the virus, Tippett said.

Managers reported significantly higher losses in an earlier study sponsored by Certus, he explained.

However, although nearly all of the organizations surveyed reported having virus expertise on staff, only 15% of the PCs represented in the study have antivirus software installed. A majority of respondents said they have purchased antivirus software but have not installed it on any PCs to protect automatically against viruses.

Tippett speculated that organizations are only now beginning to realize that educating end users is not going to be enough to ward off viruses.

Given the seriousness of the problem, the finding that organizations are not using antivirus software is surprising, Stang said.

The NCSA study indicated that the most prevalent viruses are the Jerusalem and Stoned viruses, generally thought to be benign because they were not designed to deliberately destroy data.

However, a handful of other viruses — such as the Dark Avenger and Joshi — cause the greatest number of disasters involving 25 or more PCs, according to John McAfee, president of McAfee Associates, which also helped fund the study.

IPL unveils RS/6000 storage systems

BY MARYFRAN JOHNSON
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc., a longtime provider of IBM midrange storage products, entered the workstation market last week with a line of disk and tape subsystems for the RISC System/6000.

The workstation products are in beta testing at customer sites and will be available by the end of next month. They will span the RS/6000 line from the Powerstation 320 model to the Power-servers 930 and 950, offering

8mm cartridge tape subsystems and disk drives with proprietary IPL software drivers to implement IBM's error diagnostics and recovery routines.

The IPL 3000 series tape products will be priced from \$5,600 for a tabletop, low-density model to \$17,300 for a dual-drive, rack-mounted tape drive. Capacities range from 2.5G bytes to 10G bytes (uncompressed), with a transfer rate of 500K byte/sec. for the dual-density tape drive.

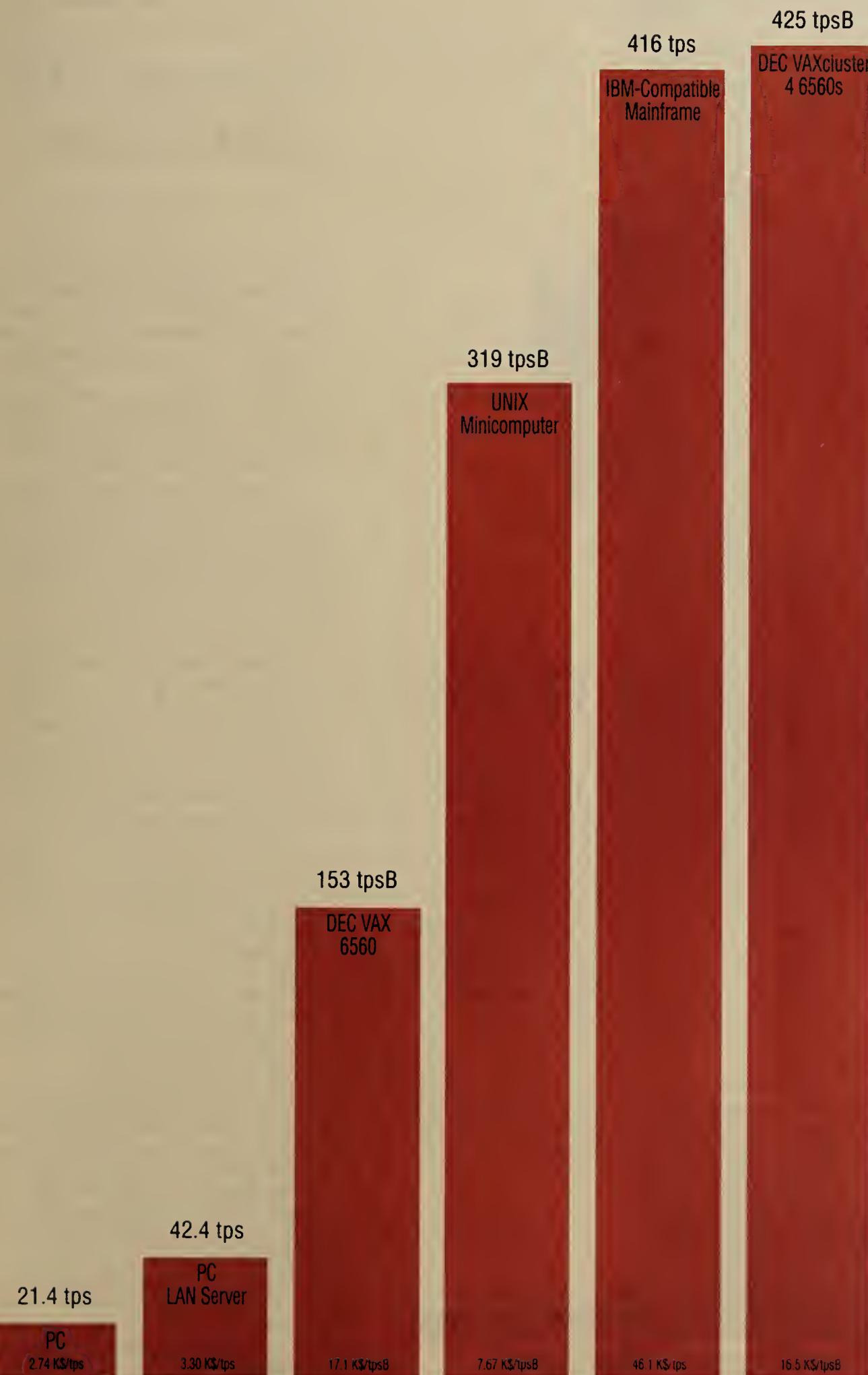
The IPL 4000 series of disk storage devices will be priced

from \$7,000 for 800M bytes to \$29,300 for 5.48G bytes.

"We will be positioning ourselves as 25% to 40% less expensive than IBM products," said Russell Bishop, who recently joined IPL from Iomega Corp. to head up the storage vendor's new workstation division. Company officials plan to leverage 18 years of experience in the IBM midrange arena.

"We don't think typical IBM users will turn to mail order," Bishop said. "It's a very different mentality from the Sun world of engineering workstations."

FASTEST EVER BENCHMARK. **425 tpsB.**



On March 12, Oracle® recorded the highest TPC

Benchmark™ B rate ever: 425 tpsB on a VAXcluster.

And the fastest TP1 score ever on January 21st: 416

tps on an IBM-compatible mainframe.

Both were industry-standard tests on 8 gigabyte databases, independently certified by Codd & Date.

All these benchmarks are further proof that ORACLE not only runs virtually everywhere, it runs fastest everywhere. Fastest on PCs, workstations, minicomputers and mainframes. Fastest on stand-alone machines, or in a client/server configuration.

So no matter what system you choose, you get the best performance and lowest cost per transaction.

No small concern to managers trying to squeeze the most out of their MIS/DP budgets.

1-800-633-1071 Ext. 8116

But don't just take our word for it. Call, and ask for the benchmark reports audited by Codd & Date. They certify the test results and give a full account of the testing methodology and system configurations.

Just the thing for a little speed reading.

ORACLE®

Software that runs on all your computers.

Word processing packages proliferate

BY CAROL HILDEBRAND
CW STAFF

Ancillary word processing activity has picked up in the last two weeks, as evidenced by a spate of second-tier product shipments and pricing changes.

Close on the heels of last month's deliveries from market leaders Wordperfect Corp. and Microsoft Corp., which released Wordperfect 5.1 for Windows and Word for Windows 2.0, respectively, came the debut of the following packages:

- NBI, Inc. said it has shipped Version 2.0 of its much-licensed Legacy word processor.

It is available for \$495, with a complicated upgrade policy offering prices ranging from \$59 to \$129.

Enhancements include the addition of a macro language, floating frames and more easily edited tables as well as advanced color imaging processing. Users can manipulate color bit-mapped images and true image cropping.

- Clarion Software Corp. has dramatically slashed the price on Report Writer, a tool for creating customized reports and queries from databases, more than halving the price from \$199 to \$79. Report Writer pulls information from such products as Borland International, Inc.'s Dbase, Lotus Development Corp.'s 1-2-3 and Microsoft's Excel to create reports through a menu-driven interface.

- Que Software shipped Rightwriter for Windows, a graphical version of its grammar and style checker. The product can check text for grammar and style in any Windows product when used with the Windows clipboard. When used in conjunction with such word processors as Wordperfect for Windows or Word for Windows, Rightwriter becomes a menu option. Pricing is set at \$99.95.
- Concentric Data Systems, Inc. announced immediate availability of a report writer for Borland's Paradox. R & R Report Writer for Paradox retails for \$249 and allows a user to create database reports without programming. The product includes what-you-see-is-what-you-get (WYSIWYG) page preview as well as extensive font support. Label, mail/merge and columnar reports and forms can all be created, the company said.

• The DOS-based Signature word processor is the offspring of the star-crossed marketing venture between IBM and Xyquest, Inc. It suffered a shipping setback when IBM pulled out in the wake of its decision to dismantle the IBM Desktop Software Unit, which was to resell the package. Signature finally shipped Nov. 15.

Now under the sole aegis of Xyquest, the product offers support to both Xywrite and IBM Displaywrite users. Something of a hybrid, Signature offers editable WYSIWYG display as well as a Common User Access-compliant pull-down menu.



"The MIS director informs me we're now as compatible as we're going to get."

Tell The Boss About Ross.

Software with Digital's latest technology built-in.

At Ross, compatibility is more than a promise. We deliver integrated, fully compatible financial, distribution and human resources software. Plus software solutions for process and discrete manufacturing and public sector organizations. All designed to give you the full benefits of the latest Digital technology.

As the world's largest application developer dedicated to Digital, we're first to incorporate its advanced technology in new and existing products. And first to back it with worldwide support. Using VMS™, SCO™ UNIX™ and ULTRIX™ — Digital's version of UNIX — our applications are designed to operate easily in open systems environments. Under Digital's Network Application Support (NAS) architecture, our client/server software lets users access and

work with corporate data on multiple platforms. From their own desktops. Transparently. With exceptional ease-of-use.

At the same time, we support Pathworks — Digital's strategic software for implementing NAS — so application developers can access data enterprise-wide. Without having to develop special purpose software. And to further speed and simplify development, we're implementing powerful 4GLs and Digital's Rdb relational database. Leveraging IS performance, connectivity, data availability and security even more.

Tell the boss about Ross: software that puts the latest Digital technology to work worldwide. Call us at 1-404-257-9198 Ext. 502 for a free Ross evaluation.

ROSS SYSTEMS
Your Digital Software Source

FINANCIAL • DISTRIBUTION • HUMAN RESOURCE • MANUFACTURING • PUBLIC SECTOR • FOURTH GENERATION LANGUAGE • BUSINESS PRODUCTIVITY

The Ross Systems logo is a trademark of Ross Systems, Inc. VMS and ULTRIX are trademarks of Digital Equipment Corporation. UNIX is a registered trademark of Unix Systems Laboratories, Inc. SCO is a registered trademark of the Santa Cruz Operation, Inc.

nounced immediate availability of a report writer for Borland's Paradox. R & R Report Writer for Paradox retails for \$249 and allows a user to create database reports without programming. The product includes what-you-see-is-what-you-get (WYSIWYG) page preview as well as extensive font support. Label, mail/merge and columnar reports and forms can all be created, the company said.

• The DOS-based Signature word processor is the offspring of the star-crossed marketing venture between IBM and Xyquest, Inc. It suffered a shipping setback when IBM pulled out in the wake of its decision to dismantle the IBM Desktop Software Unit, which was to resell the package. Signature finally shipped Nov. 15.

Now under the sole aegis of Xyquest, the product offers support to both Xywrite and IBM Displaywrite users. Something of a hybrid, Signature offers editable WYSIWYG display as well as a Common User Access-compliant pull-down menu.

TI gets real GUI with CASE tool

BY KIM S. NASH
CW STAFF

PLANO, Texas — Capitulating to pressure from CASE users who want to build software programs in a graphical environment, Texas Instruments, Inc. last week unveiled one of three planned tools for doing just that.

The company, however, caused some observers to scratch their heads when it released an IBM OS/2 module ahead of one for Microsoft Corp.'s Windows.

"Perhaps TI had a few big customers that wanted to do OS/2 development, but the rest of the world could care less about OS/2," said John Palmer, principal at Atlantic Systems Guild, Inc., a computer-aided software engineering (CASE) consulting company in New York.

The new module, which is the first part of Version 5.0 of TI's Information Engineering Facility (IEF), lets developers working in OS/2 Presentation Manager environments construct applications for a variety of platforms, including Unix machines, IBM mainframes and Digital Equipment Corp. VAXes, said Bob Bledsoe, marketing manager for IEF.

TI follows several CASE companies that have announced add-on or integrated modules for graphical user interface (GUI) development, including Intersolv, Inc., S/Cubed, Inc. and CGI Systems, Inc. [CW, Aug. 12].

As part of its statement of direction published in April, fiscally troubled Knowledgeware, Inc. vowed to bring out GUI tools, but it has yet to make good on that promise [CW, Nov. 25].

The fact that applications development vendors are making graphical tools available to users makes a strong statement about the impact of object-oriented development tools, Palmer said. CASE vendors have to give users an easy, graphical way to make software that competes with the ease of object-oriented programming, he said.

Bledsoe said TI plans to release modules for Windows and Motif in the first half of 1992. The OS/2 version is slated for availability late this month. Prices were unavailable.

To The Most Advanced RDBMS, It's Just Another Server.

Client/server computing integrates the powerful, graphical capabilities of desktop workstations with the proven data storage and processing capabilities of mainframes. Client/server computing, in essence, turns mainframes into servers.

But turning mainframes into servers creates two tough problems: Preserving MIS control over corporate data. And integrating existing applications with new ones.

Only SYBASE® solves both problems.

Unlike most RDBMS gateways, SYBASE gives MIS complete control over mainframe data, applications, and services by providing desktop access transparently through CICS—ensuring that all requests meet current transaction management, security, and monitoring requirements. In addition, SYBASE allows MIS to regulate network access to specific transactions, regions, and data sources. With SYBASE, MIS is always in control.

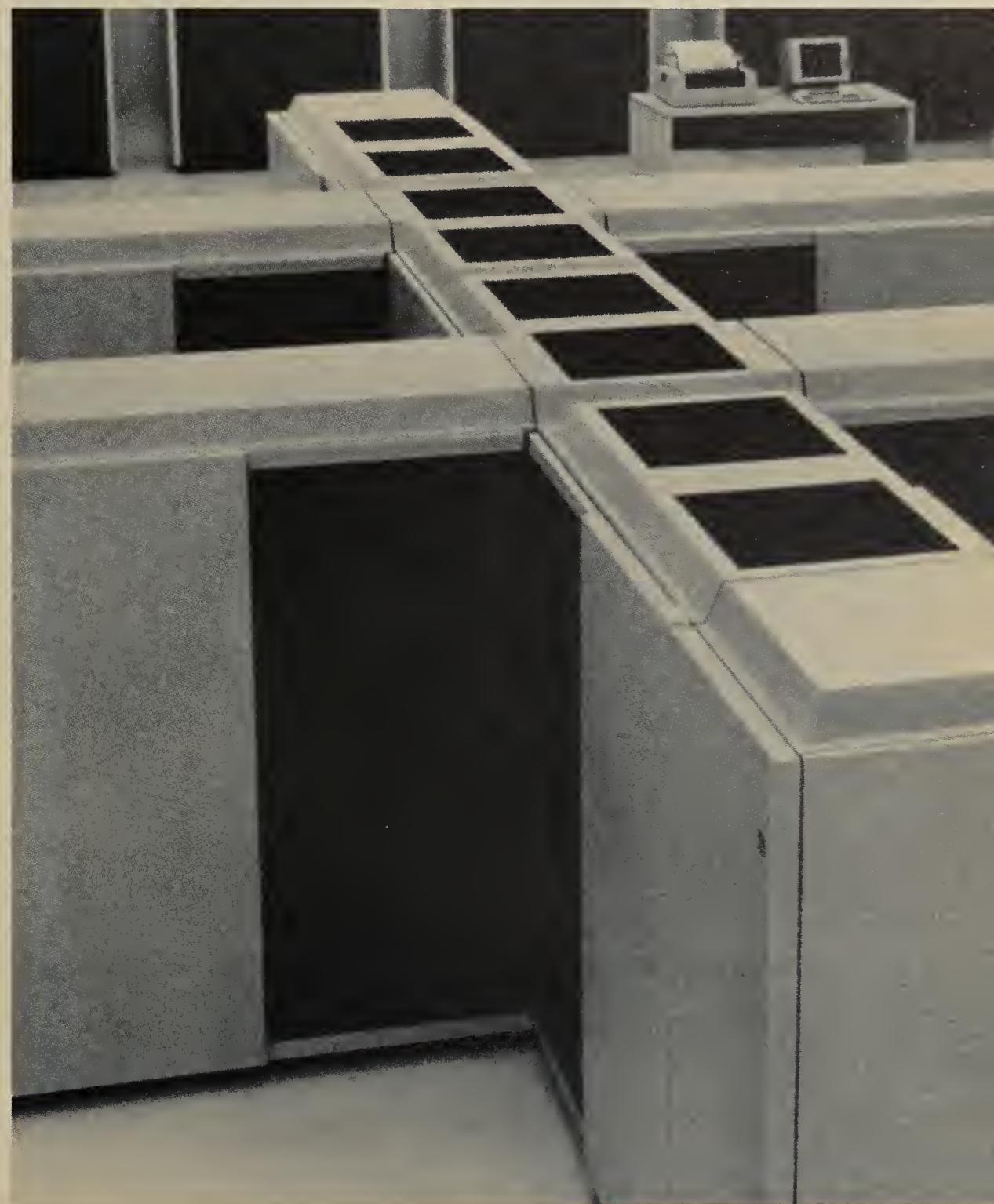
SYBASE also leverages the investments made in existing mainframe applications. SYBASE integrates new, LAN-based applications with mainframe applications written in COBOL, PL1 or Assembler, as well as with all data sources and services accessible from CICS, such as DB2, IMS/DB and VSAM. With SYBASE, existing mainframe applications don't have to be rewritten.

SYBASE is the only product that lets you effectively turn your mainframes into servers as you deploy new LAN-based applications on VAXes, UNIX, OS/2, and DOS-based platforms, Macintoshes, and others.

What's more, our professional services division, SQL Solutions, can help you design, develop, and integrate complete multi-vendor relational systems for your on-line, enterprise-wide computing environment.

To find out more, call and register for a Sybase Educational Seminar near you. Because the time to turn your mainframes into servers is now.

Just call 1-800-8-SYBASE.



© Sybase, Inc. 1991. Other company or product names may be trademarks or service marks of their respective companies.



SYBASE

Client/Server For The On-Line Enterprise



Free! "Integrating The Mainframe." It's our latest, most comprehensive information kit. For your copy, please mail this coupon to: Sybase, Inc., Dept. S, 6475 Christie Ave., Emeryville, CA 94608.

Or call 1-800-8-SYBASE.

Name _____

Title _____ Company _____

Address _____

City _____ State _____ Zip _____

Price cuts drive dealers to pump service offerings

BY CAROL HILDEBRAND
and CHRISTOPHER LINDQUIST
CW STAFF

Advanced Logic Research, Inc.'s drastic price slashing, which has resulted in the first offering of an Intel Corp. i486-based personal computer for less than \$2,000, is typical of the pricing that dealers have learned to live with for the past year.

As margins move ever closer to the

bone, dealers acknowledged last week that pricing pressures are forcing them to turn their money-making methods elsewhere. Most of them said service and support will be the new value added.

"Gross margins are coming down on the hardware side, so we're making up gross margin dollars by selling support and services," said Roger Richter, president and general manager of indirect operations at Inacomp Corp.

"The margins are slim with just selling boxes. Where the reseller can make money is on service," Computerland Corp. spokesman Steve Taylor agreed.

However, at least one analyst and former reseller said he does not believe many of them will survive the transition. "The problem is, who are they going to get to pay for it?" said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif.

Traditionally, dealers have had a tough time selling service and support to users. Merrin said resellers looking to get into the service and support game today are going to be squeezed from all sides.

Direct-mail PC vendors often provide free third-party support for their products. At the higher end, resellers will be

competing with experienced systems integrators such as Electronic Data Systems Corp.

Additionally, many customers have developed their own knowledge over the years and do not require comprehensive service from a dealer.

"I've seen a shift from 'How many boxes?' to 'How's your service? How's your support?'" said Enrique Crespo Jr., corporate manager of user computing services at The Torrington Co. in Torrington, Conn. "We're talking about serious issues, and we need somebody very knowledgeable."

Unhealthy situation

Regardless of how it is done, the need to diversify the revenue stream becomes clear after a look at ALR's most recent reseller price schedule, which was obtained by *Computerworld*. It lists three levels of figures for its products: List price and two levels of resellers' prices.

For the above-mentioned 486 model — the BusinessVEISA 486/33 Model 101 — the list price is \$1,995 and the cost to the dealer is either \$1,696 or \$1,596, depending on the volume ordered. This leaves dealers with an ap-

THE MARGINS ARE slim with just selling boxes. Where the reseller can make money is on service."

STEVE TAYLOR
COMPUTERLAND

proximate 15% gross margin if they sell at retail. The Model 101 comes with 1M byte of random-access memory and no hard drive.

However, the next two models on the BusinessVEISA 486/33 line, which come with 5M bytes of random-access memory and 120M- and 200M-byte hard drives, respectively, offer margins more in line with what is traditional: up to 28% on the highest end model, the 200-5.

"They're trying to make the money on the hard drive and peripherals," said Joe McGlone, president of McGlone & Co. in Westport, Conn. McGlone said that such efforts will drive many smaller vendors out of business.

"The only alternative is to cut the middleman," Crespo pointed out. "I buy a mainframe from IBM. If I need to buy a PC, why should I go to dealers such as Businessland?"

McGlone's point is already clear to the dealer channel. PC Edge, Inc. President Samuel Adicoff said that while superstores and large-volume vendors can survive on 10% margins, more traditional resellers must have at least 20% to 30%.

Even if margins stay the same, profits still drop because the hardware is much cheaper, Adicoff said. So, for a PC that cost \$4,000 two years ago and is \$2,000 now, "it still costs us the same amount of money to maintain that computer," he said. "Even more, because labor is more expensive than it was before."

As a result, resellers must find other areas in which to make their profits. Currently, service and support are attracting the most attention. "Hardware is the platter on which we sell our services," Adicoff said.

MODEM MANAGER

DO THE IMPOSSIBLE! Responsibilities include configuring, managing and monitoring 10, 100, 1000 or more dial-up modems simultaneously. Must be able to diagnose errors and correct them immediately — without supervision. Must report all system activity clearly and concisely on demand. Expected to work 24 hours a day. No vacation, no personal days.

AN EQUAL OPPORTUNITY EMPLOYER

YOU NEED THIS PERSON. Where can you find an individual who will take full responsibility for every aspect of your modem system? And keep it functioning under the most demanding conditions? This person will shorten response time, boost productivity and increase the ROI for your modem system. After an extensive search, you'll discover that the most qualified candidate isn't a person at all. It's the Total Control dial-up modem management system

from U.S. Robotics. And it's ready to work for you. For a resume, simply call 1 800 DIAL-USR.

TOTAL CONTROL™
With Auto Response™



The modem management system for network managers who have better things to do than manage modems.

The SAS System

All this... and OS/2®.

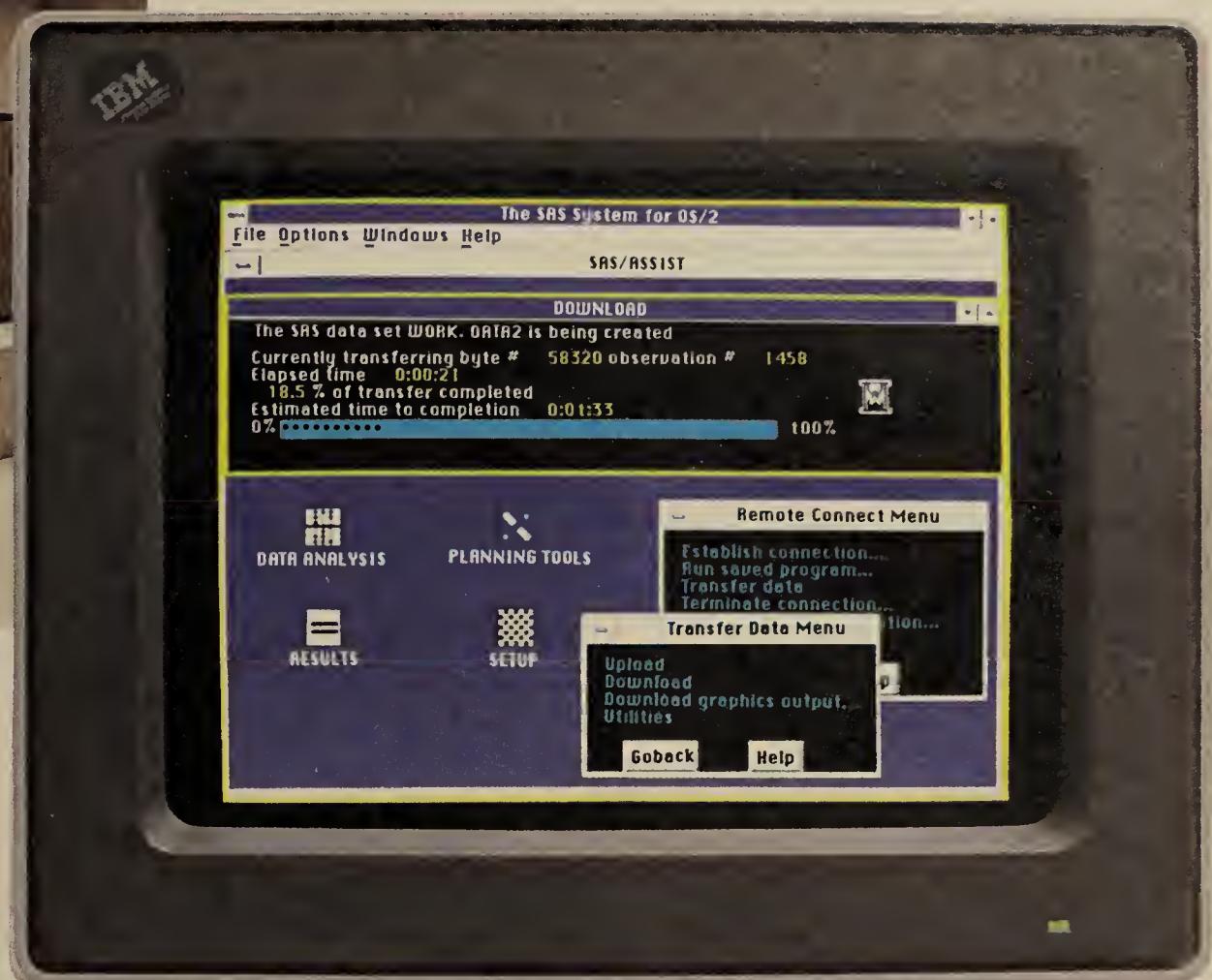


From the Data Center to the desktop, only the SAS® System brings you integrated software that exploits all the potential of enterprise-wide computing. And makes your PS/2® an integral part of your organization's information delivery strategy.

Use the SAS System as a window to *all* your data and computing resources—from mainframes and minicomputers to workstations and PCs. You'll gain complete control over data access, management, analysis, and presentation...while making SAA a reality throughout your organization.

It's never been easier to import/export data and distribute applications...to analyze data using proven tools for Executive Information Systems, decision support, forecasting, project management, quality improvement, and more...and to display the results in any format from simple lists to dazzling presentation graphs. The SAS System also takes advantage of such OS/2 features as Dynamic Data Exchange, multi-tasking, and the High Performance File System.

No wonder more and more companies are choosing the SAS System to bring out the best in OS/2. And the people who use it.



All Yours for a Free Evaluation

For a SAS System executive summary—with details about a free software evaluation and our renowned technical support, documentation, training, and consulting services—give your Software Sales Account Manager a call at 919-677-8200.



SAS Institute Inc.
Software Sales Department
SAS Campus Drive □ Cary, NC 27513
Phone 919-677-8200 □ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc. OS/2 and PS/2 are registered trademarks of IBM Corp.
Copyright © 1991 by SAS Institute Inc. Printed in the USA.



AT&T ACCUNET® T1.5 Service offers you

You make important choices for your business every day. Why not choose the T1.5 Service that lets you choose the level of reliability you need?

With AT&T ACCUNET T1.5 Service, you get the range of options you need to choose the level of reliability that you want.

One such option is NPC (Network Protection Capability), as well as APC (Access Protection Capability). NPC and APC can give you end-to-end automatic network restoration so quickly and efficiently that you probably won't even notice them working. They'll also kick in if

your ACCUNET T1.5 circuits degrade.

Or if you need to do your own network management, there's ACCUNET Bandwidth Management Service-Extended. BMS-E lets you do your own end-to-end circuit configuration generally in less than a minute.

ACCUNET T1.5 Service also has the ACCUNET Information Manager. AIM gives you trouble and performance reports that give you the earliest possible warning of an outage or difficulty. It also helps you to communicate your problem electronically and in real time to our AT&T Service Centers.



support for almost every situation.

With AT&T ACCUNET Digital Services, you get the AT&T network that's designed to be self-healing. It also has the most digital and fiber miles and the greatest number of state-of-the-art digital switches. So if you need to choose your level of support, choose AT&T ACCUNET Digital Services. And get the T1 that suits your business to a T.

*Digital solutions that match your needs.
Another AT&T advantage.*

For more information about ACCUNET Digital Services, call your AT&T Account Executive or 1 800 247-1212, Ext. 619.



AT&T

The right choice.

HP follows DEC, uses Posix to open closed systems

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. said last week that it plans to inject Posix compatibility into its proprietary MPE/XL operating system by mid-1992.

However, current users of HP's MPE/XL do not appear terribly anxious for the arrival of a Posix-compliant version of MPE, though they said it may make their lives easier in the future.

HP's Posix-compliant environment, MPE/IX, will be avail-

able one quarter after Digital Equipment Corp. begins shipping a Posix-compliant version of VMS. IBM plans to make MVS and OS/400 Posix-compliant by the third quarter of 1993.

The vendors said they hope to promote the development of large-scale Unix applications for

their proprietary computers through Posix compliance, thus giving customers an open window into closed computing.

Posix is a government standard that is starting to catch on with commercial users.

Posix is intended to make applications portable across het-

erogeneous environments. It is a specification within Unix, but applications that meet its requirements do not require the Unix operating system to run.

More flexibility

Peter Burrows, director of corporate information services at The Foxboro Co. in Foxboro, Mass., said he will not have to worry so much about whether he is using one of his HP Unix or HP proprietary computers.

"It will give us a little more flexibility as we move equipment around to different parts of the company," Burrows said.

He said he hoped that future availability of Posix-compliant financial, payroll and human resources applications would allow him to migrate applications off his IBM 4381.

Bob Adams, director of information systems at Scott Paper Ltd. in Vancouver, B.C., said the new operating system will "allow us to merge the two environments."

The company's mill has a Unix-based machine for quality control, and the administrative office has several HP proprietary systems. Adams also has a DEC system and sees DEC's move to Posix as a "positive move for future considerations."

HP is already working with third parties to port mainframe-class applications to MPE/IX, according to Glenn Osaka, worldwide marketing manager for HP proprietary computers. HP has signed up Dun & Bradstreet Software in Framingham, Mass., Lawson Associates, Inc. in Minneapolis and Uniface Corp. in Alameda, Calif., to port their commercial Unix software to MPE/IX.

HP said it intends to make more software packages available through third parties.

Who pays whom?

Unlike many vendors, software companies have to pay HP for the developer's kits, instead of HP paying vendors to port to their operating systems.

"We want to make the port as easy as it is between two Unixes, so it only takes between four to six weeks," Osaka said.

While traditional vendors are using the Posix interface to redefine open systems away from Unix to interoperability and portability, their first versions of Posix will not be fully usable, according to Steve Wendler, vice president of Gartner Group, Inc. in Stamford, Conn.

"The theory is that you can pick an application first and the box second, based on which box runs the application best. But that won't happen until about 1995," Wendler said.

He said Posix has to be extended to the operating system's "middle" standards, such as networking, database and real-time functions, before it is truly usable.

ONE TALKS. THE OTHER EMBEZZLES.

I can combine voice, data, fax and LAN over low-cost phone lines and save money.

drat!



Time was, the old stat mux was the best way to save money. Those days are gone. Your data-only multiplexor is costing you lost savings every day you use it.

For about the same price as a stat mux, you can now buy a data/voice network server able to combine remote voice, data, fax and LAN traffic over one low-cost leased line at speeds from 9.6K to 56/64 Kbps. It's called Marathon 1K and it's a breakthrough in technology and fast payback.

Using the same private line for voice and fax as well as data and LAN traffic can save big bucks month after

month on phone company toll charges. So Marathon 1K can pay for itself in just a few months, and after that all the savings go to your company's bottom line.

Products that don't save your company money are no more than profit robbers. Get Marathon instead.

Call for a free compressed voice demonstration or attend a Data/Voice Integration Workshop. Call toll-free (800) MICOM US [642-6687] or (805) 583-8600. Fax (805) 583-1997. Canada: (800) 932-DVNS.

Call today and stop wasting money.

MICOM

See Marathon live at DEXPO Fall, booth number 511.



CONGRATULATIONS. YOUR NEXT CUSTOM APPLICATION IS ALREADY HALF FINISHED.

Imagine sitting down to write a custom application in a true object-oriented world.

Where work that used to require hours of wrestling with complex code could be done graphically with a mouse.

Where interface and system objects would be right at your fingertips, ready to use without modification.

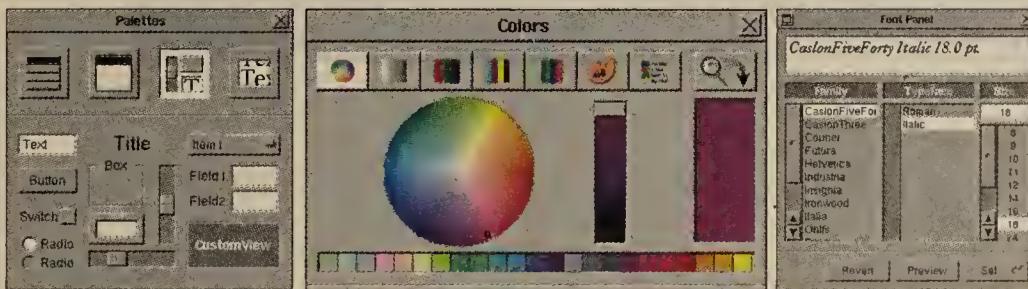
Where all your custom applications offered stunning graphics, dramatic ease of use and seamless integration with other applications.

While such a world remains at least three years away for the rest of the industry, only NeXT™ offers a polished and proven system that works today.

Our NeXTstep™ development environment is far more than a mere windowing system or a programming toolkit. It's a true object-oriented world all the way down to the system level.

Here, you can write sophisticated, intuitive programs in a fraction of the time they would require on any other platform, using tools you've never had before.

NeXTstep's Application Kit™ provides the objects common to most programs, like windows, scrolling regions and buttons. It also includes objects for printing, faxing, opening/saving



As a true object-oriented system, the NeXTstep development environment vastly simplifies the work of creating sophisticated, intuitive applications. All necessary objects are provided, along with the power to customize and add new objects of your own.

and consistent, so training time is minimized. They offer full access to all system services. Plus they integrate flawlessly with other custom software, multimedia electronic mail and the "best-of-breed" off-the-shelf solutions.

To see a vivid demonstration of the power of NeXTstep, you need only travel as far as your living room.

Just call us at 1-800-TRY-NeXT and we'll send you our developers' video, *NeXT vs. Sun: A World of Difference*. You'll see how NeXT technology can put you months ahead of your own schedule.

And years ahead of your competitors'.

files, storing data, choosing fonts and colors, processing sound, even communicating between applications. All complete with standard dialogs.

And NeXTstep's Interface Builder™ revolutionizes the way custom applications are built. You use the mouse not only to place and resize your interface objects, but to change their attributes and define how they interrelate—all without writing code. Interface Builder also helps manage every aspect of your application and every bit of your code (both C++ and Objective C are supported).

To put even greater power in your hands as a developer, the NeXTstep object library is completely open. That is, you can customize the behavior of any object via subclassing, and you can create your own custom objects that instantly become as easy to work with as the ones we supply.

NeXTstep's use of objects can save enormous amounts

of time in the future, too. Instead of starting from scratch with each new project, you can reuse existing objects. And, when it's time to update, you don't have to search through endless lines of code—you simply modify one of the objects.

Naturally, the applications that you create with NeXTstep deliver the many benefits unique to NeXT workstations. They are easy to use



Mac pushed as 3270 gateway to host

BY JIM NASH
CW STAFF

From Apple Computer, Inc.'s perspective, the idea of selling its Macintosh into the massive terminal-emulation market must glitter like the fabled golden city of El Dorado. With an estimated 20 million dumb terminals in the U.S. and an increasing trend toward downsizing, the market has great potential.

It is true that the growing need to access mainframes from the desktop has inspired some companies to boost the number of Macintosh-to-mainframe gateway

ports. Danbury, Conn.-based Union Carbide Corp., for example, has multiplied its Macintosh-to-mainframe links by a factor of six. Still, most information systems managers remain unconvinced of the Macintosh's superiority over personal computers when it comes to 3270 terminal emulation.

In response, Apple and Computer-mart, a Nashua, N.H.-based retailer, are putting together a seminar series extolling the virtues of Macintoshes as mainframe entry points.

Half of the estimated 20 million dumb terminals in the U.S. are holding 3270

sessions, according to Benny Lorenzo, an analyst at Dillon, Read & Co. in New York. Given the "relatively inexpensive" Macintosh Classic's acceptance, it makes sense for Apple to pitch it as an alternative to PC terminal emulation, he added.

According to Dataquest, Inc., 4% of all desktops in the U.S. that are attached as 3270 terminal emulation devices are Macintoshes. That calculates to 78,300 out of a total 2.1 million attached desktops. IS managers said they have yet to hear a persuasive argument, however.

Dan Willis, a 3M Co. senior analyst in St. Paul, Minn., said mainframe database

It pushes jets past 600 mph and will quickly change the way you lease computers.

The GE engine that powers some of the most advanced planes in the world is a prime example of

the forward thinking that has made GE a leader in the aviation industry. That same type of thinking

has made GE Capital Computer Leasing (formerly Decimus) a leading lessor to Fortune 500



companies, with flexible leasing arrangements that help you meet corporate, strategic, financial

and tax objectives. In a recent independent survey, our customers rated our performance highest.

- We're vendor independent, leasing both new and used equipment to give you access to more

hardware choices. • And we are GE, your assurance of our financial strength, stability and

commitment to your satisfaction. • Call 1-800-4LEASE4 to learn more about the benefits of

leasing from GE Capital Computer Leasing. Your perfect partner in these changing times.



GE Capital
Computer Leasing

access is neither inherently more reliable nor easier with the Macintosh.

Willis, who works with 3M's 3,000 Macintoshes, said Apple networks concentrate several users on one card. As with any other architecture calling for a server-mounted adapter card, if the card fails, everyone on the network loses access, he pointed out.

An Apple spokesman agreed that user support for network gateways is far from universal. But, he added, work is under way throughout the industry to develop redundant gateways and routers that balance traffic loads up to mainframes.

"It's not all that easy to mesh mainframe database [information] with Mac applications," Willis said. As with PCs, he added, "You're almost completely dependent on whatever tools have been provided to equip the database" for access from Macintoshes. Some older databases still in use today have no end-user tools for connectivity. Macintoshes support SQL, Apple has said, which allows them to update and access SQL-compliant databases.

Besides, Willis said, "Linkage to big iron was a great idea six years ago." Apple could better spend its resources "leveraging the [millions of instructions per sec-

END USERS TODAY can connect to an IBM mainframe, cut database information and paste it into Macintosh applications.

ond] on the desktop to hold the database."

Apple has been addressing the terminal emulation market since 1985. Apple, based in Cupertino, Calif., began shipping an external 3270 emulation board running Macterminal in 1985. Subsequent new products and revisions culminated this year with Snaps, an update of Apple's MacDFT Systems Network Architecture gateway. Third-party software makers, including Avatar Corp. and Andrew Corp., offer 3270 terminal emulation software for Macintoshes.

End users today can connect to an IBM mainframe, cut database information and paste it into Macintosh applications such as Excel spreadsheets and Macwrite using the sophisticated cut-and-paste capabilities standard on Macintoshes, an Apple spokesman said. Indeed, several IS administrators said they see cut and paste as one of the few possibly unique selling points for a setup such as a Macintosh LC and monitor listing for \$3,100.

However, it is still a long shot for most IS directors. "Cut and paste wouldn't swing me to buy Macs" just for terminal emulation, said Bill Burrows, assistant vice president in charge of PCs and office systems at Connecticut Mutual Life Insurance Co. in Hartford. Connecticut Mutual has but a handful of Macintoshes and about 4,000 PCs that can connect to the company's IBM 3090 model Enterprise System/9000.

Even assuming that Macintosh screens are better than Microsoft Corp.'s Windows environment for PCs, Burrows said, he does not "see how they can differentiate themselves" from PC-to-mainframe software. He and other experts pointed out that Apple's software largely mimics PC functions.

DEFINE YOUR IDEAL COMPUTER SYSTEM.



1 _____

2 _____

3 _____

4 _____

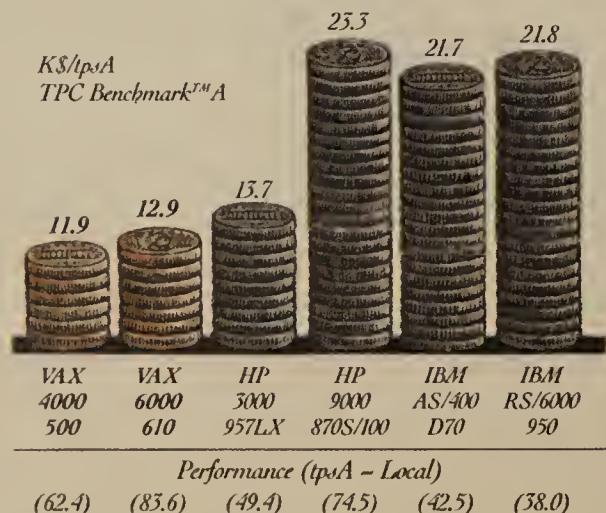
5 _____

VAX

Chances are, you want all of the features you wrote on the blank lines without any of them coming at the expense of another.

Then chances are, you're going to love our new Open VAX VMS™ systems, the first no compromise computing solution. No compromise in that you get everything you want in a system without having to make any sacrifices.

With the best price/performance, Open VAX VMS beats even RISC.



Performance

Our VAX VMS has always been known for its versatility,

dependability and rich functionality. But lately, what about its speed? Well, hang onto your keyboard because the

costs we are the industry's first major vendor to license software the way you use it - by the user.

INTRODUCING OPEN VAX VMS. *No Compromise Computing.*

performance of our Open VAX VMS actually exceeds the fastest RISC systems. And that's based on tests representing real-life applications with audited results.

Price

Such high performance doesn't come at such a high cost. In fact, Open VAX VMS delivers the best in price/performance. Again, that's not our opinion - that's based on the same real-life audited tests.

And to reduce your software



*Open VAX VMS
is the best system in
its class.*

The most productive development tools (which, by the way, have led to over 10,000 applications). And the absolute best at protecting your data and ensuring that it

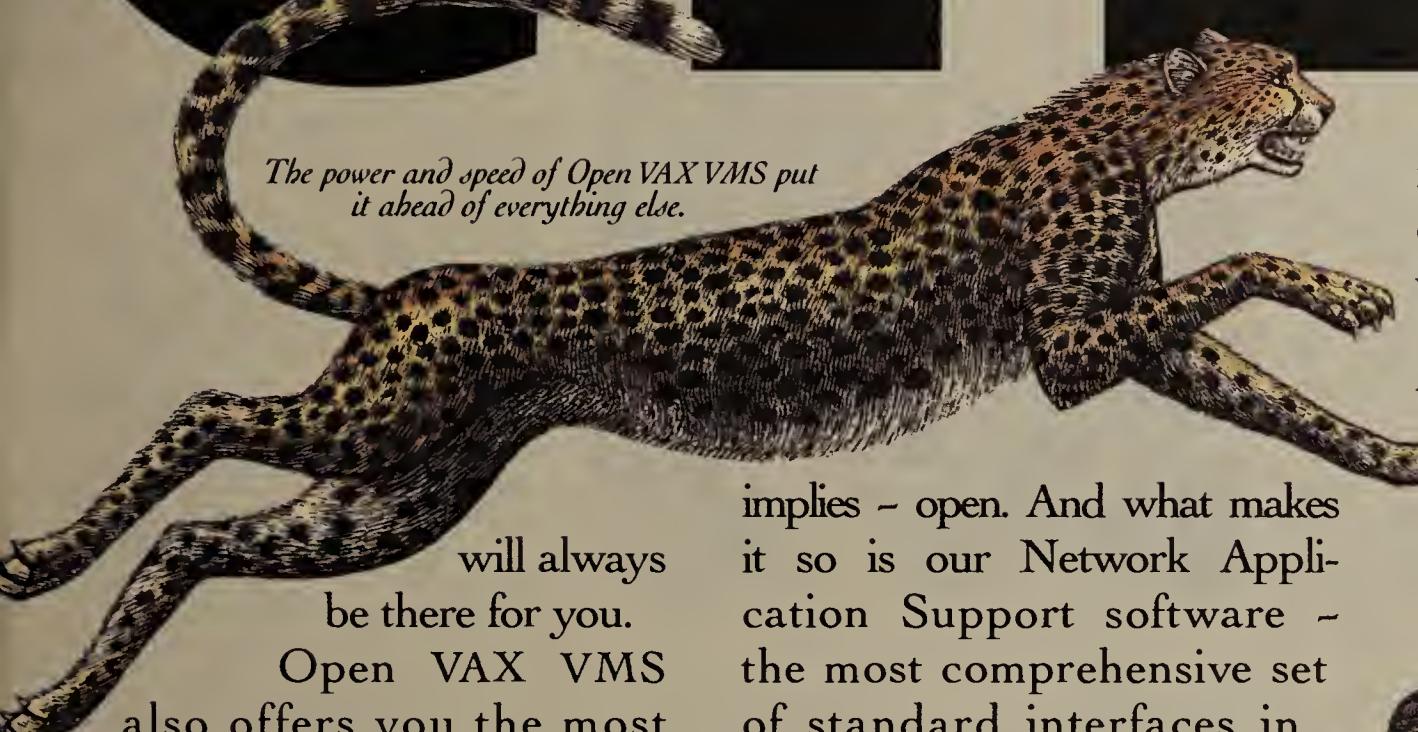


*Open VAX VMS
has the strong
functionality
you want.*

D I G I T A L. T H E

CITY

The power and speed of Open VAX VMS put it ahead of everything else.



will always
be there for you.

Open VAX VMS also offers you the most flexible growth path - from \$3,450 desktops to huge datacenter systems. And with the recent introduction of our Multi-Datacenter clusters, a datacenter can be spread out over 25 miles and still run as one computer. If a power failure (or worse) knocks out one site, the other computers in the distributed datacenter will take over automatically.

Openness

Open VAX VMS is exactly what its name



Openness is built right in, so everyone can take advantage of the richness of Open VAX VMS.

implies - open. And what makes it so is our Network Application Support software - the most comprehensive set of standard interfaces in the industry. With our new NAS products, you will be able to write an application once and play it on Open VAX VMS or any number of the different platforms that may exist within your company.

Support

Since Open VAX VMS is from Digital, it's backed by a worldwide service organization of 40,000 people. And with our open services, we can support



Our support organization works in partnership with your organization.

more than 8,000 products from over 800 vendors as though they were our own products.

So one service plan, tailored to your company's specific needs and budget, is all you'll need.

Performance, price, functionality, openness, and support. If they don't define your ideal computer system, let us know what does by faxing your list back to us at

(508) 264-5472. Or if you would like some more information, you can give us a call at (800) 344-4825, extension 925.

Because chances are, what's on your list is in Open VAX VMS, the no compromise computing solution. **digital**™

OPEN ADVANTAGE.

IBM, RS/6000 AND AS/400 ARE REGISTERED TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES CORPORATION. TPC BENCHMARK™A IS A TRADEMARK OF THE TRANSACTION PROCESSING PERFORMANCE COUNCIL. BENCHMARK DATA AS OF 10/31/91.

ADVANCED TECHNOLOGY

TECH TALK

Tires with brains

The Goodyear Tire & Rubber Co. early next year plans to introduce "smart" truck tires with electronic "brains" embedded in them. The tires contain microprocessors and radio frequency transponders designed to communicate information about the tire to a handheld computer. The automated tire management technology will be used to tag tires with virtually indestructible identification numbers. Eventually, the system will communicate other information related to tire wear and performance, and a smart patch containing electronics and transponders that can be adhered to existing tires will be available.

Lights on a pinhead

Scientists at AT&T Bell Laboratories reported last week that they have made and operated the world's smallest semiconductor lasers. Seen through a scanning electron microscope, the lasers look like microscopic thumbtacks. The "head" of each tack is only 400 atoms thick. At least 10,000 of the lasers, which may be used either as surface- or side-emitting devices, would fit on the head of a pin. The small, fast, low-power lasers are part of an ongoing research effort into developing optical computing and switching technologies.

Composers on computers

Music students at Case Western Reserve University in Cleveland are participating in a first-of-its-kind project using computers to analyze the music scores of the great composers, measure by measure. Richard Rodda, who designed the musical scores project, said a computer program he developed allows students to access performances of a given work and match them directly with the musical score. Students are able to study similarities between composers in greater detail as well as compare a number of interpretations of a piece of music.

Wave of the future — with a catch

Parallel processors are fast and affordable, but programming snags leave users leery

BY GARY H. ANTHES
CW STAFF

Prudential Securities, Inc. has two IBM 3090/600 mainframes with vector processors and a gaggle of Digital Equipment Corp. VAXs, but "they aren't up to the task," said David Audley, director of Prudential's Financial Services Group. The task: to evaluate hundreds of financial scenarios using an econometric model while an investor in mortgage-backed securities waits on the telephone.

For a while, Prudential rented time on a Cray Research, Inc. supercomputer, but that proved too costly. Now the firm can run through 32 number-crunching economic scenarios simultaneously using a \$1 million in-house Intel Corp. parallel computer powered by 32 I860 microprocessors.

Nearly everyone now concedes that the highest performance computers of the future will employ parallel architectures with dozens to tens of thousands of processors. Most major makers of high-performance computers, including Cray, IBM and DEC, have said they will embrace the technology one way or another [CW, Nov. 25].

The good news is these massively parallel computers are fast and relatively inexpensive. The bad news is they can be devilishly hard to program.

Two major approaches to massively parallel computing are competing for

the hearts and minds of users. Computers from Thinking Machines Corp. have traditionally used a single instruction/multiple data (SIMD) method, in which each processor executes the same instruction at the same time but on different data. To get good performance, SIMD applications should have

into multiple, parallel streams of logic. Coordinating the processors, each of which has its own local memory, can be tricky.

Porting serial programs — still the vast majority of existing software — to MIMD machines may be straightforward, but more often it is not.

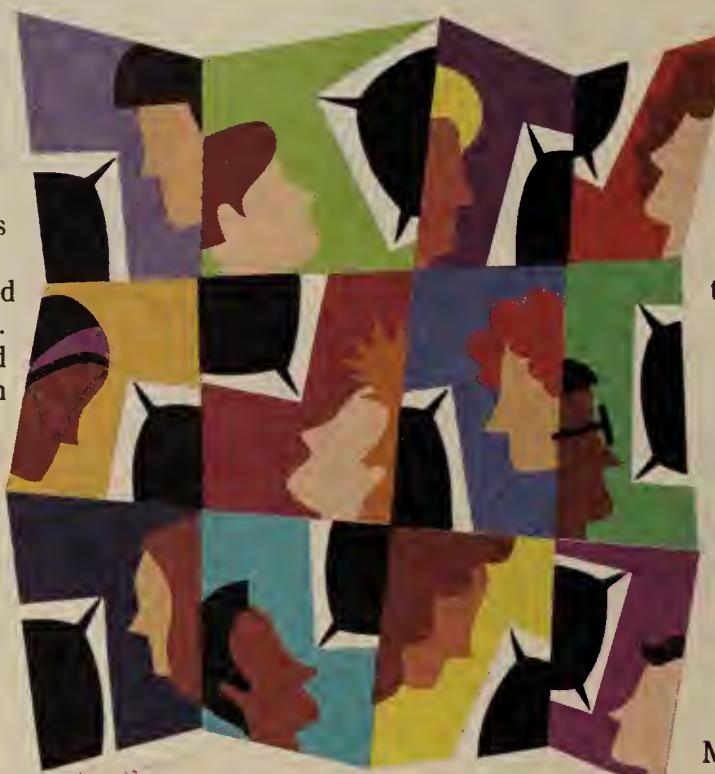
In an attempt to combine the inherent flexibility of MIMD with the ease of use of SIMD, Thinking Machines recently introduced a hybrid architecture it said would "open up the bottleneck of parallel software development." The secret to that trick, the company said, lies in a new control network that can broadcast the same instructions to all processors and synchronize their execution whenever SIMD execution makes sense. But when execution gets to the point where processors need to do different things, they begin to fetch instructions from their own local cache memories, which are replenished by the operating system. It is all invisible to the user, Thinking Machines said.

But Jack Dongarra, a computer science professor at the University of Tennessee and a high-performance computer authority, said the bottleneck is not about to open up any time soon: "Massively parallel systems are not intended for general-purpose computing. It is nontrivial to take applications and move them to these machines. The bottom line is they are not at all at the current state of, say, Cray [supercomputers]." He said he had studied the new Thinking Machines architecture and concluded that users will still need to tune their code considerably to get maximum performance.

While the consensus in the user community remains that parallel computing is difficult, there are clearly exceptions. Audley said the econometric model, 100,000 lines of C developed on a Sun Microsystems, Inc. workstation, was ported to the Intel machine in a day and was running on 16 processors in a week. About 40 lines of code had to be changed to make the port, he said.

Seven similar applications were also ported to the Intel in about a week, he said. Audley said the programmers doing this work do not have to be wizards, but they do have to thoroughly understand the applications. The applications are a good fit for the Intel's MIMD architecture because the economic scenarios being evaluated are fairly independent, he said.

"Everyone believes that parallel processing is the wave of the future for price/performance. No one wants to use parallel processors, but we have no choice," Dongarra added.



John Pirman

data that can be split evenly across all processors so that none remains idle.

Parallel machines from Intel Supercomputers and others use a multiple instruction/multiple data (MIMD) architecture, in which each processor executes its own set of instructions. Here the programmer has the harder task of breaking the application code

Weeding out the glitches

A multifaceted attack on the parallel programming problem has been under way for several years and seems to be slowly paying off:

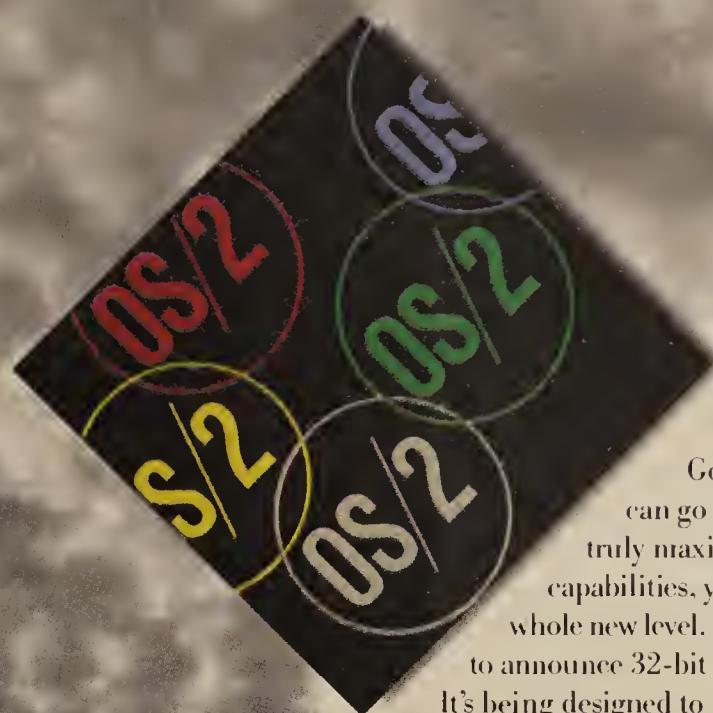
- Compilers are getting better — but are still not expert — at automatically "parallelizing" serial code.
- Work on algorithms has produced ways to structure programs for parallel processing, even in applications that had previously been thought to be inherently serial.
- Much effort is now going into developing software tools for porting, developing and debugging software for parallel machines.
- Commercially available applications for parallel computers and libraries of standard parallel routines are becoming more common.

However, the biggest advance in parallel computing may be the erosion of the fear, uncertainty and doubt (FUD) factor, according to Justin Rattner, technology director at Intel Supercomputers, a division of Santa Clara, Calif.-based Intel Corp.

"FUD has subsided to a great extent because people are doing it. When there were no examples on the production side, it was easy for manufacturers of nonparallel equipment to play on people's fears. It's like learning to ride a bike: It's hard at the time, but once you master it, it's not that difficult."

GARY H. ANTHES

Why be content to run when you can fly?



Going as far as you can go isn't far enough. To truly maximize your computing capabilities, you have to function at a whole new level. That's why we're proud to announce 32-bit OS/2® Version 2.0.

It's being designed to let you run OS/2, DOS and Windows™ applications from a single system, with more available memory, true multi-tasking, application protection and a 32-bit base system that will keep you out in front.

With DOS, Windows and OS/2 support, 32-bit OS/2 2.0 will rise above the software compatibility barrier of the past, giving you access to thousands of applications created for those environments. So OS/2 2.0 protects your software investment as well as preserves your software echoes. And that's increasingly important as more and more applications become available. As a platform for integration, nothing else even comes close.

No less of a breakthrough is the Workplace Shell interface that's being designed to remove even more of the obstacles of yesterday's computing environment. This friendly, graphical interface will make personal computing easier than ever and more powerful too. Built-in interactive education will keep you up and running, and there are productivity tools, a high performance file system, games and more. So there's almost no limit to how far you can go.

Act now and you can start with OS/2 1.3 SE for just \$99 if you own IBM DOS—\$150 otherwise—and you'll be eligible to get an upgrade to OS/2 2.0 upon release at no extra charge.* To order OS/2 1.3, call 1 800 342-6672** or contact your authorized IBM dealer or IBM marketing representative. And find out how OS/2 2.0 can break through for you.

OS/2. Breaking through.



EDITORIAL

Changing times

Three years ago in this space, we wrote of IBM's drive to reform and redirect the company, as per its own press releases. We likened the effort to that of an enormous ship that had wandered into a fjord and was struggling to find open water and running room once again.

Somewhere along the way, IBM sailed into a storm that became a typhoon that spawned a whirlpool, and now the dreadnought seems caught up in its vortex as it spins from one direction to another.

As this was being written last week, the IBM board of directors was conferring once again on how to halt the cycle of poor business performance resulting in layoffs, more poor performance and more layoffs. That meeting followed a now infamous "I'm mad as hell, and I'm not going to take it anymore" memo that IBM Chairman John Akers directed at his company's managers six months ago.

With the company's unceremonious bumping of George Conrades from his post as general manager of IBM U.S. last week, it seems Akers' and the board's anger is now on the verge of spinning out of control. You start to wonder how much is being done to benefit the customer and thereby the company and how much is being done to show Wall Street that IBM is serious — about what, we're not sure these days.

IBM's problem is not complex. It has prospered over most of the last three decades by selling large computer systems based on its proprietary architecture. Today, the market is demanding smaller, less expensive machines based on open architectures that do not tie the customers to one vendor. That is, the company is no longer in sync with the market — similar to the situation the U.S. car companies found themselves in beginning in the late 1970s.

IBM's problems wouldn't be such news if the company weren't IBM. But even the heads of many of IBM's staunchest rivals will tell you that in addition to being huge, the company is also an icon in a world where the image of the omnipotent American corporation is fading. Thus, the failure of IBM, these people say, would be fundamentally bad for all of us.

Whether that is true is beyond our analytical abilities. But one thing is certain: If the company does fail — and that is not out of the realm of possibility — it will be because of its failure to serve its customers, who historically have been counted as some of the most loyal people anywhere.

Firing people, shuffling executives, making pronouncements and promises of getting closer to the customer and being more "responsive" are the easy things. Changing a company's culture from the inside out to meet dynamic market conditions is, and has been, the real challenge for IBM. To this point, the only thing that can be said is that Akers has not succeeded in meeting it.

Bill Laberis



LETTERS TO THE EDITOR

IS means business

"'Brain barriers' limit IS change" [CW, Nov. 4] says that the "U.S. must overcome middle management's traditional opposition to technology."

I contend that information systems people do a very poor job selling the benefits that this technology provides.

All too often, IS people talk about faster response times, access to companywide data and better user interfaces without translating these features into solid, well-documented business benefits. IS must get past the typical gee-whiz technical presentations and begin to address the business-oriented issues.

For example: How much will the technology cost? How will this technology solve the needs of the business? How much will it cost the business not to implement the suggested changes? What is the return on investment for this project? Is this the best solution? What is the expected life of the technology if implemented? What are the expected problems with the plan? Will the proposed cost of this project be better spent elsewhere?

A business is a financial entity. IS must use the tools of business analysis to demonstrate how their solutions will make the business more successful.

Paul O. Sweeney
Boxboro, Mass.

Cost a concern

Like Rick Marshall's boss, I'm not quite sure what he's saying in his Viewpoint article, "What, exactly, do you mean by 'downsizing?'" [CW, Nov. 4].

As a management consultant specializing in the systems de-

velopment process, I'm neither for nor against downsizing. I am for the continuous improvement of the way systems groups perform and of the performance of the systems products they create and support. Continuous evaluation of performance and follow-up action to continuously improve the development process usually precludes any surprising downsizing projects.

Downsizing costs money, time, effort and emotional energy. Whether one should make this investment depends on the degree to which the results will pay off over the subsequent several years.

Unfortunately, the decision to downsize is often based on overly optimistic expectations and is made without sufficient evaluation of costs and benefits.

George Pitagorsky
Pitagorsky Consulting, Inc.
New York

CPSR credit

In "Private matters" [CW, Nov. 11], you ask if we should consider the formation of a group named something like "The Union of Socially Conscious IS Professionals."

The group has already been formed and is 10 years old. Its actual name is Computer Professionals for Social Responsibility (CPSR). It has been involved in the privacy field for some time.

Ironically enough, immediately preceding that editorial, you give over most of a page to a feature on another CPSR activity, the 21st Century Project. Thank you for paying attention to these important issues.

James D. Gawn
Millersville University
Millersville, Pa.

For the record

In the article, "Hidden costs can undermine savings from outsourcing" [CW, Nov. 18], *Computerworld* attributed the following statement to me: Dollar Dry Dock Bank found that employee severance costs ... drove the outsourcing costs to a much higher figure than expected during the first year.

What I actually stated is quite to the contrary: Dollar Dry Dock fully anticipated both severance costs and vendor penalties in our first year, experiencing less savings than in the remaining years of our contract.

Not only were these expenses anticipated, but they came in below budget, improving our first-year savings goal by almost 5%.

I also take exception to the suggestion that Dollar Dry Dock did not get the bargain it anticipated. Our bank anticipates realizing a better than 25% annual cost savings during our six-year agreement with Mellon Bank Corp. To date, we are ahead of that goal.

John J. Maher
First vice president
Dollar Dry Dock Bank
Elmsford, N.Y.

Computerworld acknowledges a reporting and editing error in the piece referenced.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

Subscribing to Computerworld makes perfect cents.

Yes, I want to receive my own copy of Computerworld each week. I accept your offer of \$38.95* per year — only 76¢ an issue.

| | | |
|------------|---------|-----------|
| First Name | MI | Last Name |
| Title | Company | |
| Address | | |
| City | State | Zip |

CA residents add applicable sales tax. Address Shown: Home Business New Renew Basic Rate:\$48 per year
*U.S. Only. Canada \$58.97, Central/South America \$130, Europe \$195, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.

Please complete the information below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/
Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related
Systems or Peripherals
- 85. System Integrators, VARs, Computer Service
Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
- 75. User: Other _____
- 95. Vendor: Other _____

(Please specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP
IS/MIS/DP Management
 - 21. Dir./Mgr. MIS Services, Information Center
 - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
Network Sys. Mgt.; LAN Mgr., PC Mgr.
 - 23. Dir./Mgr. Sys. Development, Sys. Architecture
 - 31. Mgrs., Suprv. of Programming, Software Dev.
 - 32. Programmers, Software Developers
 - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
 - 12. Vice President, Asst. VP
 - 13. Treasurer, Controller, Financial Officer
 - 41. Engineering, Scientific, R&D, Tech. Mgt.
 - 51. Sales & Mktg. Management

3. IS INVOLVEMENT (Circle all that apply)

Please indicate your involvement in IS/MIS/DP.

- A. Manage/Supervise IS/MIS/DP Staff
- B. Recommend/Specify IS Equipment
- C. Purchase IS Equipment
- D. End-user of IS Equipment
- E. No Involvement

OTHER PROFESSIONALS

- 70. Medical, Legal, Accounting Mgt.
- 80. Educator, Journalists, Librarians, Students
- 90. Others _____

(Please specify)

COMPUTERWORLD

E4148-6

Subscribing to Computerworld makes perfect cents.

Yes, I want to receive my own copy of Computerworld each week. I accept your offer of \$38.95* per year — only 76¢ an issue.



| | | |
|------------|---------|-----------|
| First Name | MI | Last Name |
| Title | Company | |
| Address | | |
| City | State | Zip |

CA residents add applicable sales tax. Address Shown: Home Business New Renew Basic Rate:\$48 per year
*U.S. Only. Canada \$58.97, Central/South America \$130, Europe \$195, all other countries \$295.
Foreign orders must be prepaid in U.S. dollars.

Please complete the information below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/
Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related
Systems or Peripherals
- 85. System Integrators, VARs, Computer Service
Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
- 75. User: Other _____
- 95. Vendor: Other _____

(Please specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP
IS/MIS/DP Management
 - 21. Dir./Mgr. MIS Services, Information Center
 - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
Network Sys. Mgt.; LAN Mgr., PC Mgr.
 - 23. Dir./Mgr. Sys. Development, Sys. Architecture
 - 31. Mgrs., Suprv. of Programming, Software Dev.
 - 32. Programmers, Software Developers
 - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
 - 12. Vice President, Asst. VP
 - 13. Treasurer, Controller, Financial Officer
 - 41. Engineering, Scientific, R&D, Tech. Mgt.
 - 51. Sales & Mktg. Management

3. IS INVOLVEMENT (Circle all that apply)

Please indicate your involvement in IS/MIS/DP.

- A. Manage/Supervise IS/MIS/DP Staff
- B. Recommend/Specify IS Equipment
- C. Purchase IS Equipment
- D. End-user of IS Equipment
- E. No Involvement

COMPUTERWORLD

E4148-6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



COMPUTERWORLD

| | |
|---|---|
| Editor in Chief | Bill Laberis |
| Executive Editor | Paul Gillin |
| News Editor | Alan Alper |
| Technology Editor | James Connolly |
| Assistant News Editor | Patricia Keefe |
| Senior Editors | Clinton Wilder, Management Elisabeth Horwitt, Networking Michael Alexander, Advanced Technology Rosemary Hamilton, Personal Computing Nell Margolis, Industry Maryfran Johnson, Workstations Joanie M. Wexler, Networking |
| Senior Writers | Sally Cusack Michael Fitzgerald |
| Staff Writers | Carol Hildebrand Christopher Lindquist Kim S. Nash |
| New Products Writer | Derek Slater |
| Features Editor | Joanne Kelleher |
| Senior Editors | Joseph Maglietta Lory Zottola Mary Grover Brandel Joyce Chutchian |
| Associate Editors | Cathleen A. Duffy Alan J. Ryan |
| Researcher | Jodie Naze |
| Assistant Researcher | Stefanie McCann |
| Intern | Lisa Davidson |
| Research Manager | Michael L. Sullivan-Trainor |
| Research Coordinator | Kevin Burden |
| Chief Copy Editor | Catherine Gagnon |
| Assistant Chief Copy Editor | Alice Lesch Kelly |
| Features Copy Editor | Kimberlee A. Smith |
| Copy Editors | Kelly E. Dwyer Steven J. Condon Lisa MacFarren Anne McCrory Stephen P. Klett Jr. |
| Design Director | Nancy Kowal |
| Graphics Designer | Tom Monahan |
| Design Assistant | Marie J. Haines |
| Graphics Specialists | Janel Genovese Michael Siggins |
| Assistant to the Editor in Chief | Linda Gorgone |
| Editorial Assistants | Lorraine Witzell Connie Brown Aleksandra Skulte |
| Rights and Permissions Manager | Sharon Bryant |
| Back Issues | Margaret McIndoe |
| News Bureaus | Mid-Atlantic (201) 967-1350 |
| | Johanna Ambrosio, Senior Correspondent |
| | Washington, D.C. Mitch Betts, National Correspondent (202) 347-6718 |
| | Gary H. Anthes, Senior Correspondent (202) 347-0134 |
| | West Coast (415) 347-0555 |
| | Jean Bozman, Senior West Coast Editor Clinton Wilder, Senior Editor, Management J. A. Savage, Senior Correspondent James Daly, Senior Correspondent Jim Nash, Correspondent Marilyn Scott, Editorial Assistant |
| | Midwest (708) 827-4433 |
| | Ellis Booker, Bureau Chief |
| | IDG News Service Penny Winn, Director |
| | Main Editorial Office Box 9171, 375 Cochituate Road Framingham, MA 01701-9171 (508) 879-0700 |
| | Fax: (508) 875-8931 |
| | MCI Mail: COMPUTERWORLD |
| | Subscriptions: (800) 669-1002 |

Job drought won't last forever

FREDERIC G. WITTINGTON



The employment picture looks bad right now — worse than I can remember in my 38 years in the information industry. Virtually every vendor is laying people off. Most users are, too. There is demand for a few scarce types of specialists, but layoffs are the rule as organizations undergo system downsizing, mergers or just plain contraction because of sliced budgets. This isn't going to last forever, though. In fact, I think the ingredients for a turnaround are already in place.

Young people who are looking elsewhere for career opportunities should look again, because the information industry is in the process of opening up a whole new set of management opportunities. They will be somewhat different from those we have known, but they will be more numerous than ever before.

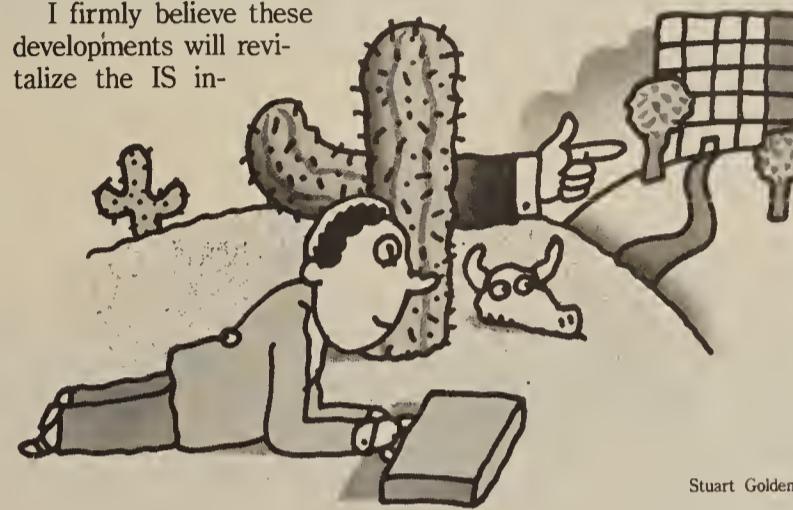
Some of the factors that will revitalize and change the employment situation are the following: the arrival of authentic open systems, which the market has been waiting a long time to see; the maturation of technologies to cope with the logic and overhead of data and function

distribution; the simultaneous arrival of reasons to utilize multimedia and practical voice, image and interactive technologies; the pending arrival of digital television, which will effectively bring PC power to everyone who owns a TV set; and the rapid growth of the systems integration industry, including outsourcing.

I firmly believe these developments will revitalize the IS in-

ment, standards, system integrity and security, data administration and central procurement. Whether this person works with internal divisional users or with outside service suppliers, he or she will be responsible for keeping it all together.

- **Solution manager.**



Stuart Goldenberg

In user organizations this will be a divisional role, unless applications development is centralized. On the vendor side, the solution manager will be the client account manager for a system integrator or manager of a service offering for a firm providing data services. This person will be responsible for an applications area for the ongoing development and operation of an information service that meets the needs of end users. The solution

manager will usually provide the service through a network provided by the environment manager.

- **Module manager.**

This will be the most common type of management position in hardware or software vendor organizations. The products of the future will be sophisticated complexes of hardware and software, sold in most cases to operate in open networks. Network servers, communications processors, fault-tolerant processors, even workstations, will be programmed by their end users only in standard interface languages. Even technically sophisticated users will know or care little about how they operate internally. Each such product module will have to have a manager who procures soft and hard components, sees to the product's assembly and quality and oversees its marketing and service. The module manager will be responsible for making sure the assigned product line remains competitive and for marketing it to environment managers, who will, in turn, be responding to the needs of solution managers.

The present employment drought isn't going to last forever. The sooner we prepare for the opportunities that will follow, the better off we'll be.

Withington, a 30-year veteran of the computer industry, was a vice-president at Arthur D. Little, Inc. and is now an independent consultant.

Portrait of a programmer as a young technophobe

WILLIAM LEVINE



There once was a time when arithmetic was done in the head and not with a calculator. This was the time that

spawned my generation of computer professionals. This explains why some 12-year-olds have 13 years of Cobol experience, while we former slide-rule jockeys are still struggling to read manuals. In the interest of better intergenerational understanding on computer staffs everywhere, I offer the following recollections of how computers stole gradually into my life:

Scene One (Sometime in the 1950s): The teacher passes out "IBM" cards and warns us not to "fold, spindle or mutilate" them, as is written on the cards, under any circumstances.

"Do not," she adds in an aside of her own, "let your dog chew on these very, very important computer cards."

I sense that the computer is one thing you don't mess with,

just like those mattress tags you can only tear off under penalty of imprisonment. I'm glad the computer is not in my house. I'll settle for an electric pencil sharpener any day, because you can always chew a pencil without getting in trouble.

My *Weekly Reader* has a picture of a computer. The computer makes dwarfs of the Mr. Wizard types standing in front of it in white coats. The article says the machine can add thousands of numbers in a second. I can't even say "nine times nine" in a second. You must have to be a genius to use a computer, I figure.

There's something that puzzles me, though. It says in the article that this machine processes thousands of punch cards per second. If that's true, why would it care if you mutilated a few?

Scene Two (1961-1967): For a six-year period, my curiosity about computers is dormant. During this time, it would take a peripheral device's falling on my head to make me aware that there are computers out there. I go to the New York World's Fair, and it doesn't dawn on me that

computers are the main ingredient behind the fair's smorgasbord of technology. I fail to appreciate that behind the cloying dolls of "It's a Small World," there are probably many small, small computer chips.

Scene Three (soon thereafter): I'm hunkered down at my desk ready to take the Scholastic Aptitude Test. I have 12 pencils laid out in a wagon-train circle around my test booklet, but then a terrible thought hits me — maybe these aren't really all No. 2 pencils. I bought them at a discount store; what if they are really just No. 1.75s or something? Everyone knows the computer won't acknowledge answers from anything but a No. 2 pencil. And even that's no sure thing. If I don't erase a smudge correctly, the computer might get confused. I could be smudged out of a good college, a good career.

The computer, it occurs to me, is now an important player in my life, but unfortunately, one that is on an infallibility kick.

Scene Four (a year or two later): The computer quiz machine at Zayre's is trying to stump me again. "What is the national dog of Ireland?" it asks. My fraternity brother suggests the answer is "any Englishman," but I know that the right multiple-choice answer is "the Kerry blue terrier." I enter my answer

and the machine acknowledges my scholarship by flashing its lights. This is the first time I've seen a computer in a role other than the world's foremost record keeper. For once I feel smarter than the computer. After all, the computer itself has just displayed on the screen the news that my 12 correct answers for 12 questions attempted qualifies me as a subgenius.

Despite my subgenius rating, I remain in awe of most things digital for quite a while. It never occurs to me that my own logic box has an edge over the computer until I become a programmer. I then realize that while it takes a couple dozen machine commands for a computer to retrieve something, my dog only needs one fetch command. Once that occurs to me, I am no longer awestruck by the computer.

Most programmers of my generation, myself included, have become well acquainted with many computers, but we started a little too late to ever view the computer as a "second self." Therefore, we don't think we're personally to blame when a program abends. We just figure we're being unjustly punished for any folding, spindling or mutilating we did years ago.

Levine is an IS professional at a financial services company in the Boston area.

JUST WHEN YOU THOUGHT IT WOULD TAKE A MIRACLE
TO ACCESS ALL YOUR CORPORATE DATA...

INFORMATION BUILDERS INTRODUCES ENTERPRISE DATA ACCESS/SOL™



The Information Warehouse Solution for SQL based Access to Relational and Non-relational Data.

The exciting breakthrough is here... Enterprise Data Access/SQL (EDA/SQL), the key component of IBM's Information Warehouse framework. EDA/SQL is a family of client/server products that works together to extend the reach of SQL based tools and programs for accessing both new data and legacy data stored in IMS, VSAM, and other non-relational DBMSs and files. EDA/SQL is the only product that gives you a uniform, relational view of data, regardless of how and where its stored.

From spreadsheet applications to complex business systems, EDA/SQL provides the power and flexibility to support

virtually any SQL based application. Popular tools like Lotus 1-2-3 and QMF - even 3GL applications - can use native commands and syntax to access over 45 local or remote proprietary databases and files.

Now, you can have a true open network architecture. Integrate new and existing hardware and network configurations with EDA/SQL's interlocking communications components that support most major network architectures. You can design the most cost-effective environment of interconnecting PCs, workstations, midrange and mainframe platforms. And have complete control over the data access environment

with centralized security management, on local and remote servers. You don't have to wait for a miracle. Now your data access problems can be solved. Call Information Builders today.

 **EDA/SQL**

Information Builders, Inc.
1250 Broadway, New York, NY 10001

800-969-INFO

212-736-4433; In Canada 416-364-2760
This advertisement refers to numerous products by their trade names.
In most, if not all cases, these designations are claimed as trademarks
or registered trademarks by their respective companies.



SYSTEMS & SOFTWARE

SOFTWARE NOTES PeopleSoft expands

PeopleSoft, Inc. in Walnut Creek, Calif., has announced that the newest release of its client/server human resources software, PS/HRMS 2.0, is now available for IBM's DB2 environment and Gupta Technologies, Inc.'s SQLbase on OS/2. The package, which supports Microsoft Corp.'s Windows, is an integrated payroll, benefits and human resources system.

Recital Corp. has released Version 7.1 of its Recital fourth-generation language and relational database package. The latest version is tailored for on-line transaction processing applications and has a distributed cache manager that allows database and index I/O operations to be significantly reduced. Recital runs on Digital Equipment Corp. VAX/VMS and Unix platforms.

DEC recently announced that AI Corp., an independent provider of smart applications development tools, has joined the DEC Complementary Marketing Program. DEC and AI Corp. sales representatives will jointly market Knowledge Base Management System, AI Corp.'s flagship applications development tool, for use on DEC's VAX platforms in the U.S. and Canada.

BY JOHANNA AMBROSIO
CW STAFF

SAP AG's revamped applications software product line may be more than a year late, but the company is betting it is not a deutsche mark short of customers' expectations.

The company, based in Wallendorf, Germany, had originally intended for its R/3 family of integrated financial, manufacturing and other applications to be ready late last year.

However, midway through the development cycle, SAP changed direction; instead of simply enhancing its existing R/2 mainframe system, it opted to base the whole works on a client/server architecture of Unix machines and personal computers. The mainframe still plays a role in the new product lineup as a database server.

"You could say we are a year late," said Hasso Plattner, the firm's vice chairman. "But being a year earlier and not being able to use the new technology would have been a huge disadvantage."

Users are not exactly breaking down the door to get at the

new product, which is being beta-tested at 18 sites in Europe. Beta testing in North America is scheduled to begin in mid-1992, with general availability expected here by late next year.

"R/3 is very interesting," said R. Bruce Hazell, operations project leader at Esso Resources Canada Ltd. in Calgary and an R/2 user. "We have plans to address the client/server area but no immediate plans to install R/3."

"Most of our customers won't implement R/3 right away because many of them are just beginning to look at client/server technology," said James Bensman, president of SAP America, SAP's Lester, Pa.-based subsidiary. "They'll watch and wait, and they'll jump when the time is right."

Because of customers' dual needs — keeping the mainframe systems alive while experiment-

ing with client/server technology — SAP plans to enhance its existing R/2 systems at least through the end of the decade, Plattner said.

At SAP America's recent user conference, held last month in New Orleans, the company announced R/2 Version 5.0, with enhanced functionality for the logistics, human resources and financial modules.

Users seem more interested in Version 5.0 of R/2 than they are in R/3, at least for the time being.

Rick Bibbons, project supervisor at Cincinnati Gas & Electric Co. in Ohio, said he plans to install Version 5.0 at some point but has "no current plans" for R/3. "We are pleased about R/3, though, because it gives us another option in the future," he said.

Nevertheless, the eventual issue for SAP customers — some 1,600 worldwide and

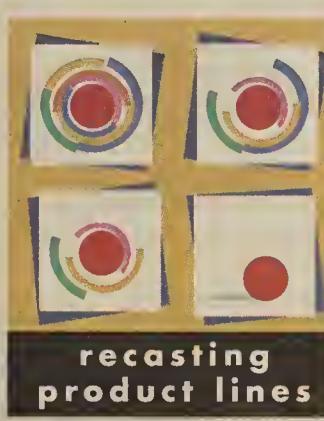
about 50 in the U.S., including Amoco Corp., The Dow Chemical Co., Eastman Kodak Co. and Schindler Elevator Corp. — is migration from R/2 to R/3.

Although the product lines will be able to communicate, the data and tables need to be ported or rewritten to work in the new environment. SAP has promised tools to help users accomplish this.

Both the R/2 and R/3 systems will be able to communicate through common communications protocols, and both are based on the same active data dictionary and SAP's proprietary fourth-generation language.

However, R/3 adds some other features, including graphical interface support, complete online documentation with hypertext and the ability to scan documents into the accounts receivable system, according to Plattner.

The beta-test version of R/3 will include approximately 40% of the R/2 system's applications modules; Plattner would not disclose a specific time when the rest would be available.



Factory planning tool gives Deere flexibility

BY MARYFRAN JOHNSON
CW STAFF

As suppliers of more than half of North America's largest tractors, the Deere & Co. factory in Waterloo, Iowa, takes manufacturing resource planning (MRP) as seriously as horsepower.

Yet the massive complexity of its homegrown MRP system was cramping Deere's ability to re-

spond quickly to market changes. Planning any significant changes in factory processes took at least three or four months — an undesirable situation for a plant generating \$1.5 billion in sales annually and tracking some 70,000 active part numbers.

Then along came Carp Systems International (CSI) and its Advanced Planning System — a

kind of MRP mimic that dramatically speeds up the planning process with a front-end processor and a suite of decision-support applications and tools.

"I've been in materials now for almost 18 years, and I'd never seen anything like this," said Jay Harmon, manager of complete goods and production planning at the Waterloo factory, which signed on as one of CSI's first customers two years ago. "We believe the machine paid for itself in three months. Today, we have the flexibility to change options for our industrial transmissions [manufacture] up to one week before we build it."

Two weeks ago, CSI entered the Unix world with the announcement of new versions of its planning system for the IBM RISC System/6000 and Hewlett-Packard Co. HP700 series workstations.

"This should enable our customers to take advantage of industry standards as they downsize their MRP applications into client/server, distributed processing architectures," said Jim Manion, president of Kanata, Ontario-based CSI.

Unix-based versions for Digital Equipment Corp. and Sun Microsystems, Inc. machines will

Continued on page 33

IF YOUR COMPANY MAILED 500 LETTERS A DAY OUR MAINFRAME SOFTWARE COULD SAVE YOU \$1 MILLION A YEAR

Savings of up to 70% are easily achievable. In fact impressive savings begin with as few as 100 letters a day.

Introducing NAPERSOFT's Automated Correspondence Systems (ACS). Discover the awesome power available to support end users in marketing, sales and customer service. Use ACS for seamless integration of personalized form letters with your customer data base. With ACS

you're gaining more than a simple letter generator; you're getting a family of powerful new business tools which are easily integrated into your mission-critical, production business systems.

- NAPER-BRIDGE™ for easy re-engineering of workflows;
- NAPER-WORD® for word processing/form letter building;
- NAPER-SPELL™ for spell checking, hyphenation

- and thesaurus;
- NAPER-MERGE™ for mail merge and personalization;
- NAPER-TOOL KIT™ for on-line letter history and notepads;
- NAPER-DOC™ for preparation of documentation and manuals;
- NAPER-MERGE Batch Option™ for high volume letter generation.

NAPERSOFT's ACS can reduce the elapsed time to prepare a letter from minutes, hours and sometimes days... to a few seconds. Cost savings are even more impressive. With the average cost to produce a letter over \$10, five hundred letters a day would annually cost about \$1.3 million. A savings of 70% puts nearly \$1 million back in

your pocket. In responding to the challenge of high volume mail, automated correspondence represents a far better utilization of resources than word processing.

If you've been struggling with an in-house solution to the customer correspondence problem take another look at the potential million dollar waste of using word processing for high volume mail... then ask yourself if this isn't an opportunity for you to save your company a lot of money while improving end user support.

For a complete literature pack call 708-420-1515, Or write NAPERSOFT, Inc., One Energy Center, Naperville, Illinois 60563-8466.

NAPERSOFT
708-420-1515

Yes, I'd like to save \$1 million a year. Please send literature.

Name _____

Title _____

Company _____

Address _____

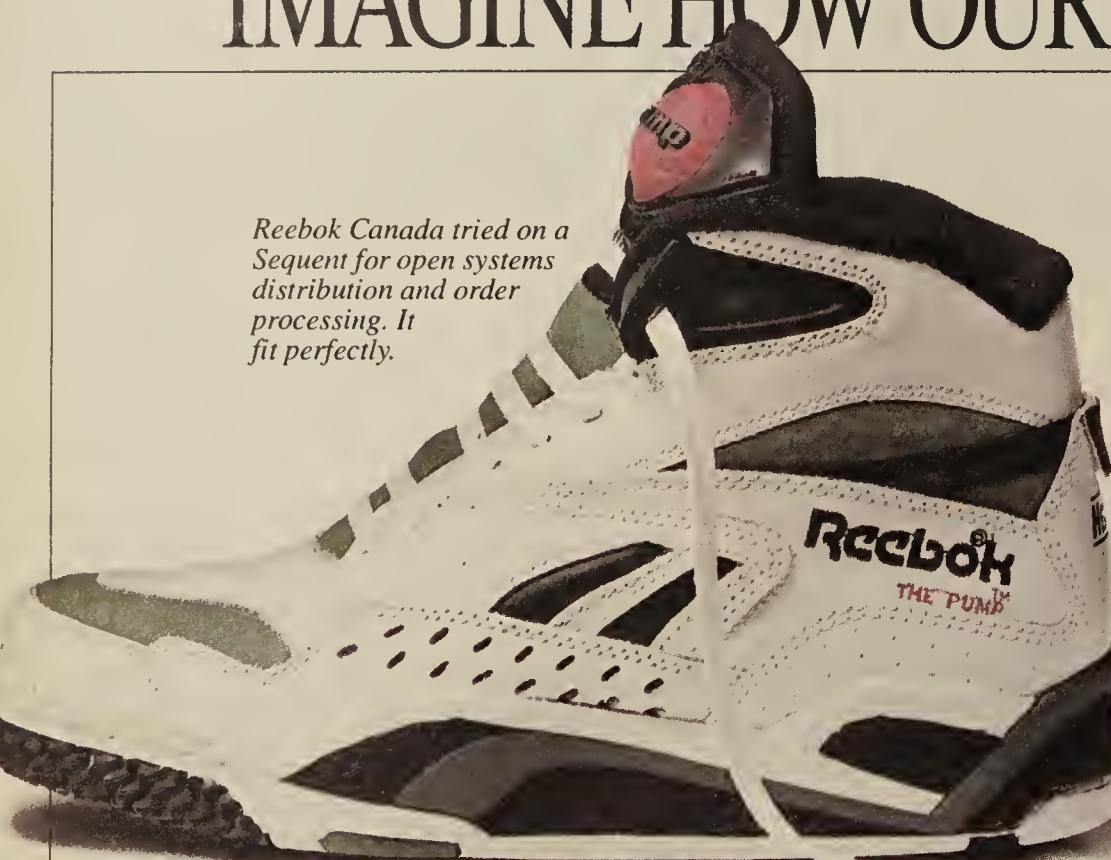
City, State, Zip _____

Phone _____

Operating System: MVS VSE

SURPRISED THESE COMPANIES WENT WITH AN OPEN SYSTEM FROM SEQUENT? IMAGINE HOW OUR COMPETITION FELT.

Reebok Canada tried on a Sequent for open systems distribution and order processing. It fit perfectly.



Radisson had no reservations about going to an open reservations system with Sequent.



When US WEST wanted a new system for customer information, credit, and end-user computing, we made the connection.



When Volkswagen de México shifted to a new system for RDBMS-based inventory management they parked at Sequent.



Texaco's Latin America/West Africa division needed a financial accounting system and they came to Sequent for full service.



Dollar has put plenty of mileage on their on-line reservations system from Sequent.

It may be news to you that Sequent is one of the top three companies considered most when purchasing an open OLTP system.*

But it will come as no surprise to any of the companies above. Or to any of the other 2500 corporations around the world with Sequent open systems successfully running strategic OLTP and decision support applications.

Each and every one of our customers saw the enormous benefits of switching to an open system to handle their critical applications.

And after thoroughly studying the competition, they decided the best wasn't necessarily the most famous.

For a complimentary video tape on how we deliver customer success in open systems OLTP and decision support, call 1-800-854-0428.

Our lines are always open.



Autolite sparked to Sequent when it came time to put manufacturing on-line.



We made Tootsie Roll a sweet deal when they chose to put their entire corporation on a Sequent system.

Imaging system a whiz

Requests for Kansas birth, death records now tracked faster

ON SITE

BY ELLIS BOOKER
CW STAFF

TOPEKA, Kan. — Birth and death go on pretty much as they always have here. But now the state does a far better job keeping track of life's starts and finishes.

A document imaging system deployed by the State of Kansas' Office of Vital Statistics has dramatically decreased the time it takes to process citizens' requests for records, while using fewer staff members.

"At our low point, in 1987, we were taking four to six weeks to process a request," State Registrar Lorne A. Philips acknowledged.

Even so, the manual system was turning a profit for the state.

"But we were providing lousy service," said Philips, who is also director of the Division of Information Systems at the Kansas Department of Health and Environment.

Speedier document turnaround

Nowadays the office, which issues 250,000 to 300,000 certified documents annually, claims a turnaround time for requested documents of less than a day, down from four to six weeks with the manual system. Turnaround time on the

HP seeks mainframe competition

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. recently took aim at IBM's Enterprise System/9000, unveiling two new mainframe-size reduced instruction set computing (RISC)-based computers for under \$1 million.

The company also introduced storage peripherals for the computers employing technology said to rival direct-access storage devices (DASD).

Dana Brown, vice president of information systems at California Compensation Insurance Co. in Novato, Calif., said the multiprocessor RISC systems answer his problems by providing an upward migration path.

No need for IBM mainframe

Brown explained that the insurance firm has grown tenfold in the last two years and currently uses a two-processor HP system. "We're getting off service bureaus, and we don't own an IBM mainframe."

He added that after finishing an "exhaustive" hardware survey, he saw no reason to buy an IBM-style mainframe.

The three-processor HP 3000 Series 980/300 runs between 158.4 trans./sec. and 170.6 trans./sec. The four-processor 980/400 runs between 194.4 trans./sec.

imaging system is a mere 12 seconds.

This process involves a mainframe query to find a match on the mainframe document index, the retrieval of the correct optical disc from the optical disc jukebox and, finally, the sending of the image record to a high-speed laser printer. In addition, a number of security checks are undertaken during this process.

The system currently contains about 2.5 million document images.

With the new system, the office was able to reduce its work force by six, to 32 employees. So successful was the imaging deployment, in fact, that the Office of Vital Statistics received the 1991 Recognition Award for Outstanding Achievement in the field of information technology from the National Association of State Information Resource Executives.

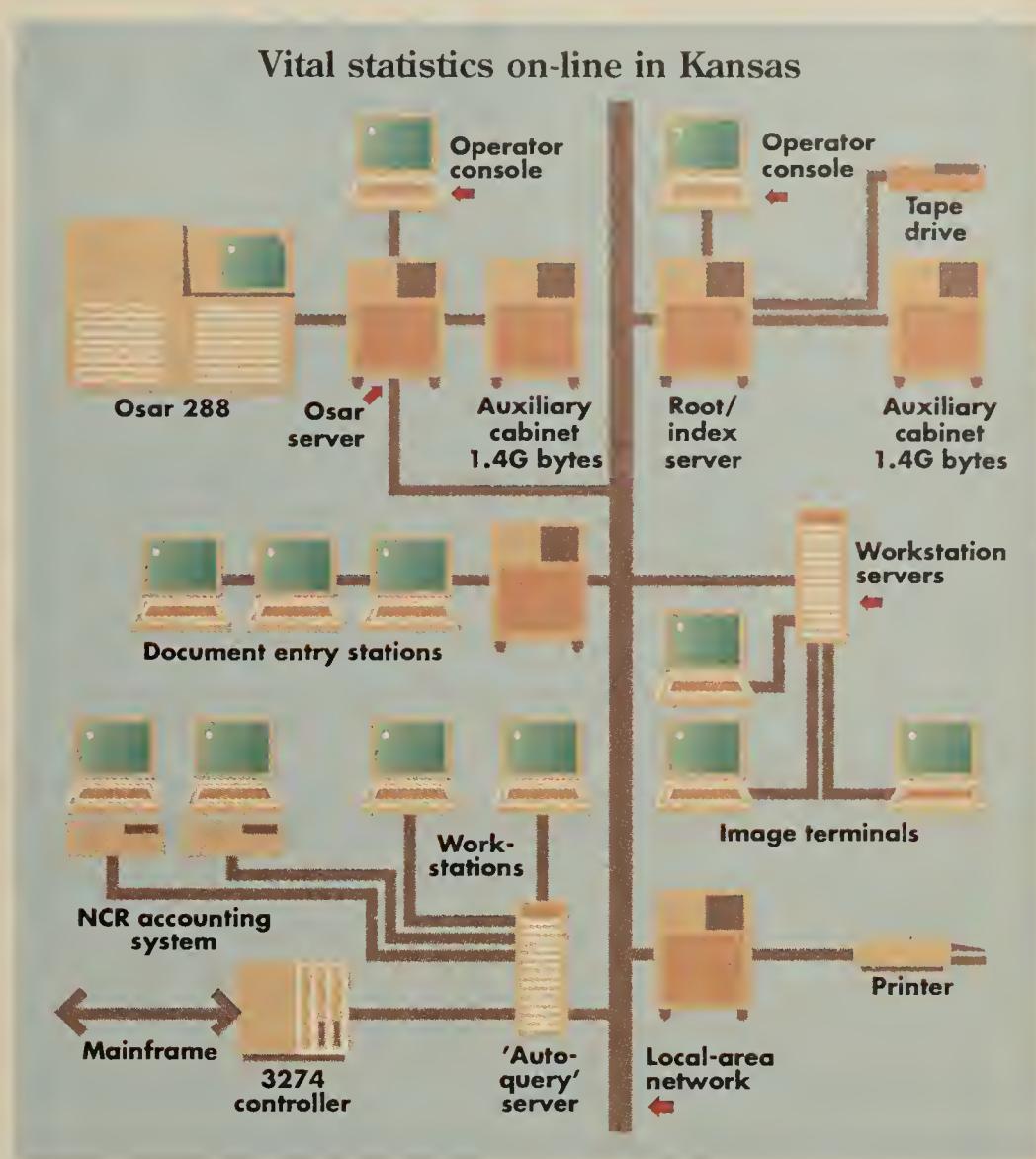
The major impetus for the imaging system was a number of changes in the late 1980s in state and federal legislation.

The Internal Revenue Service began to demand Social Security numbers for children, and the Department of Labor and Housing and Urban Development began requiring birth certificates for citizens seeking jobs and housing.

"And nationally," Philips said, "there was a push to do something about missing children — such as requiring the use of a birth certificate for entry into and transfer between schools."

Costa Mesa, Calif.-based Filenet Corp. won out over a pack of several document imaging vendors, including finalists Eastman Kodak Co. and Wang Laboratories, Inc.

Philips said Filenet won the job because it "learned what vital statistics



were all about and didn't say, 'Oh, your [application is] just like this bank's or this trucking company's.'

At a cost of \$1.5 million — including the cost to convert the backlog of paper documents — the imaging system features Filenet's largest optical jukebox, the OSAR 288; a dedicated jukebox server and a dedicated image index server (both with backups); 11 image terminals;

two high-capacity print stations; and two document-entry stations.

The jukebox has a maximum storage capacity of 288G bytes, or roughly 300 years' worth of Kansas birth and death certificates.

Within a year, a fax server will be added to the configuration, allowing the central office in Topeka to send certificates by fax to the six regional offices.

First MCC spin-off releases Extract cost-saving data conversion tools

BY KIM S. NASH
CW STAFF

Evolutionary Technologies, Inc., an Austin, Texas-based start-up, recently released a product that reportedly cuts big blocks of time and money typically spent on data conversion projects.

The Extract Tool Suite, a five-product set of conversion, library and database modules, was designed to move data transparently to and from different databases, regardless of platform or operating system, said Robin Curle, executive vice president and co-founder.

Unlike other translation tools, the Extract Tool Suite, priced between \$50,000 and \$300,000, automatically generates conversion programs, Curle said.

Users define traits of the data they want moved and the operating systems and databases that hold that information. "Then they guide Extract through the generation of conversion programs by pointing and clicking," she said.

The product, which runs on workstations from Sun Microsystems, Inc., can reduce the time required to do data conversions by a margin of 10-to-1, said Hugh Jones, president of H. V. Jones Co., a Houston-based systems integrator that

specializes in mainframe downsizing and Oracle Corp. relational database conversions.

Evolutionary Technologies, which is the first spin-off of Austin-based consortium Microelectronics and Computer Technology Corp., is targeting Extract at both user companies and integrators.

THE PRODUCT CAN reduce the time required to do data conversions by 10-to-1.

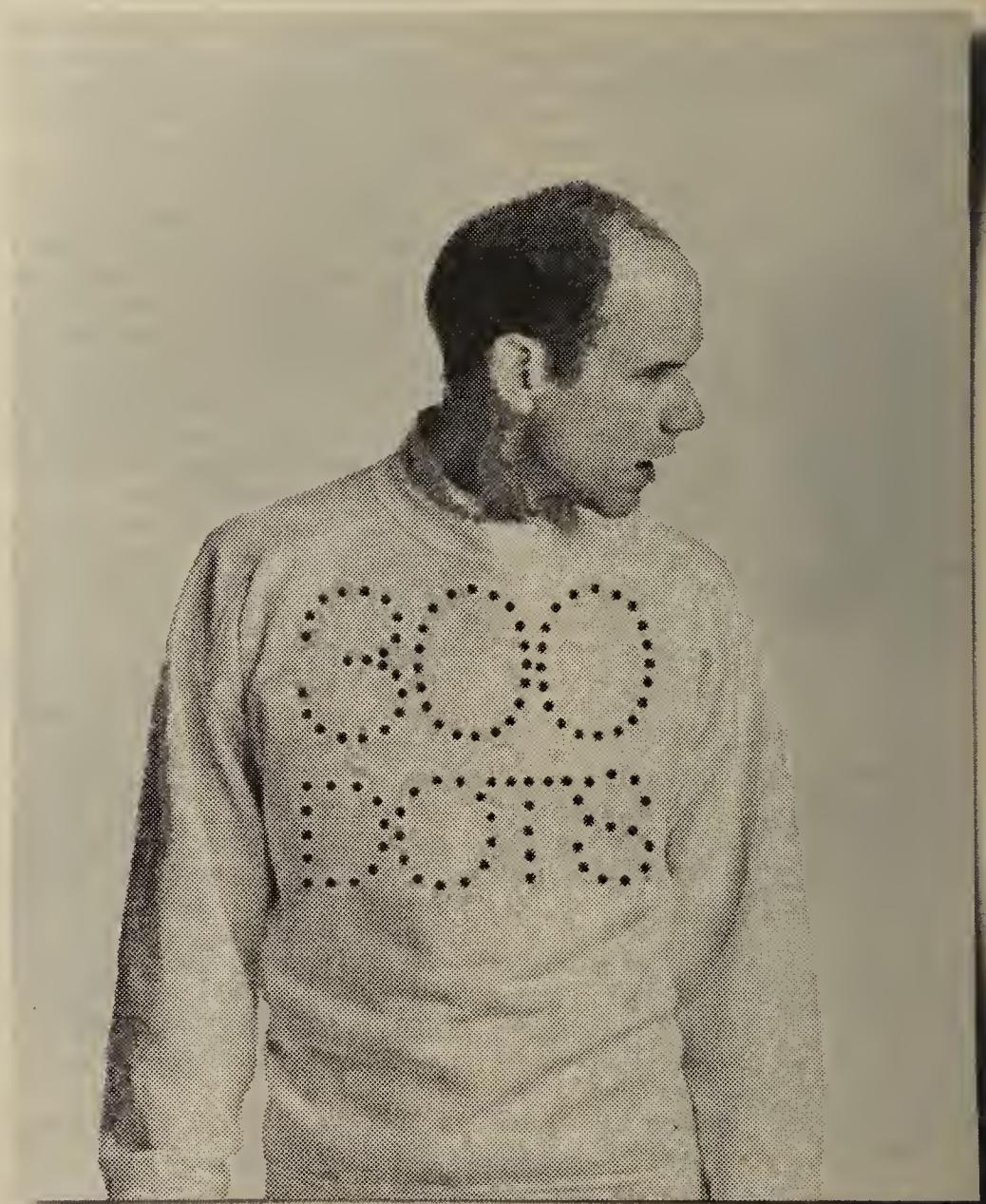
Jones recently submitted a bid to a Texas-area utility that wants to make customer billing and other account information available transparently to users in branch offices.

"We turned in a bid for 12 man-weeks of work, way under the two years we estimated it would take doing [the conversion] the traditional way," Jones said.

Evolutionary Technologies will port Extract to other Unix workstations on request. The company plans to introduce a DOS version in 1992.

At 600 x 600 dpi, the new IBM for any image.

*HP LaserJet III
with PostScript option:
300 x 300 dpi, max.*



Courier
Courier Oblique
Courier Bold
Courier Bold Oblique
Times New Roman
Times New Roman Italic
Times New Roman Bold
Times New Roman Bold Italic
Helvetica
Helvetica Italic
Helvetica Bold
Helvetica Bold Italic
Helvetica Narrow
Helvetica Narrow Italic
Helvetica Narrow Bold
Helvetica Narrow Bold Italic

Times
Times Bold
Times Italic
Times Bold Italic
Univers
Univers Bold
Univers Italic
Univers Bold Italic

IBM
LaserPrinters

Sixteen scalable fonts, built in—twice
as many as an HP LaserJet. And
our fonts are Type-I. Theirs aren't.

There's no end to the ways the
new IBM LaserPrinters can make a body
look good.

For starters, there's an Adobe® PostScript®
option that delivers a true 600 x 600 dots
per inch. It gives you up to *four times* the
resolution of PostScript on any HP LaserJet
printer. Camera-ready output, on your
desktop, for thousands of dollars less than
ever before.

But the eye-catching advantages
of the new IBM LaserPrinters aren't just for
PostScript users.

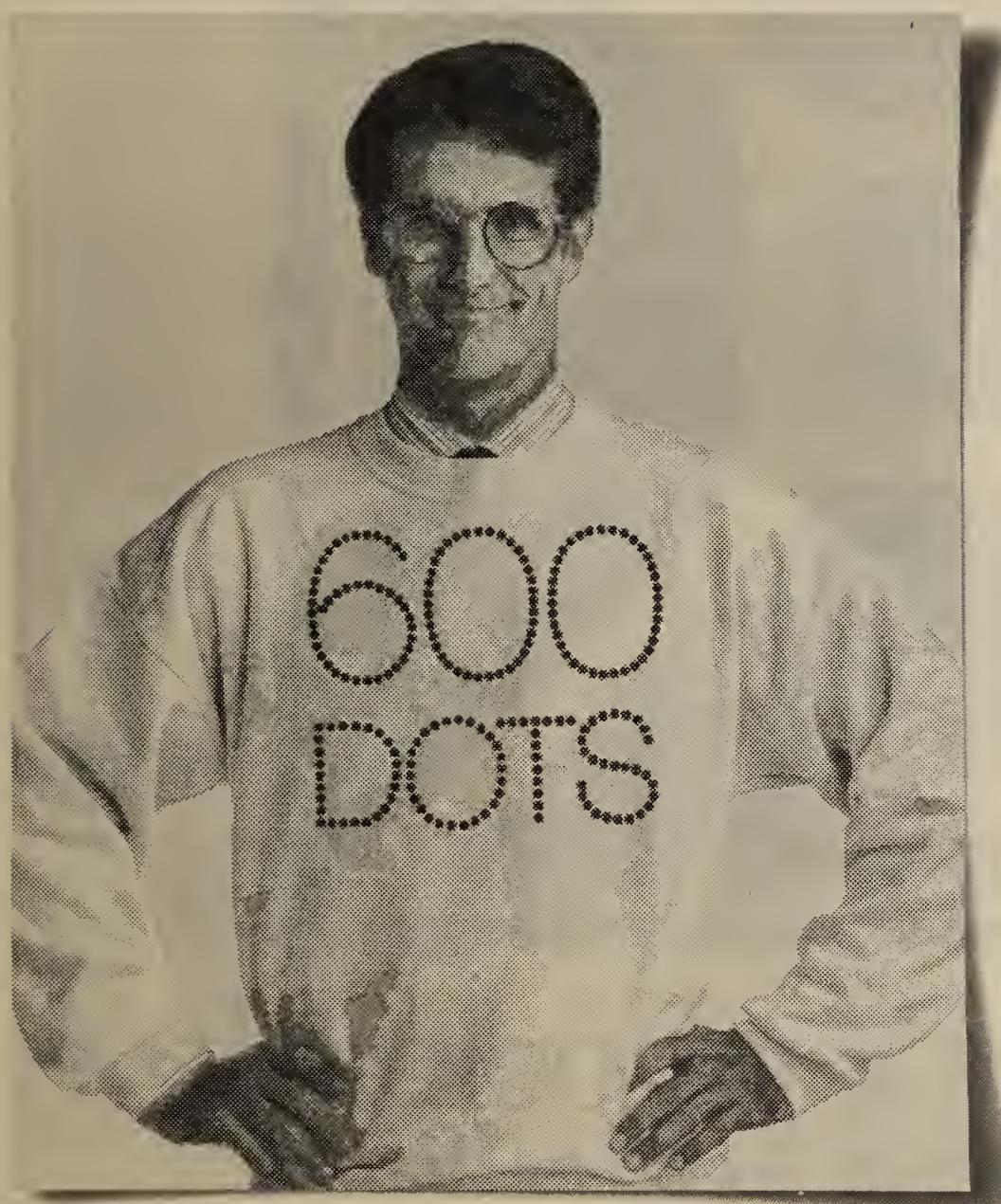


HP LaserJet jump-gap
toner system vs. our
contact-transfer. A clean win
for the IBM LaserPrinter.
(10 x enlargement)

600 x 600 dpi PostScript option, available for LaserPrinter 6, 10 and 10L, requires 5MB total memory. Adobe and PostScript are registered trademarks of Adobe Systems Inc. HP and LaserJet are registered trademarks of Hewlett-Packard Company. IBM is a registered trademark of International Business Machines Corporation.

T H E N E W I B M L A S E R

LaserPrinter does wonders Especially yours.



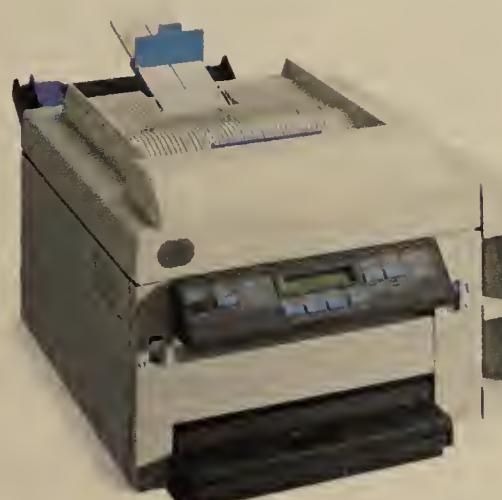
*IBM LaserPrinter
with PostScript option: 600 x 600 dpi—
up to four times the resolution.*

Sixteen built-in scalable fonts are standard equipment—twice as many as the LaserJet III. They're Type-1 fonts with Adobe scaling technology, online and always ready, without waiting for downloads.

IBM PQET LaserJet RET

RR
*Can't see the difference?
No wonder. Our PQET
enhancement is the equal of
anything in the industry.*

Also standard on every new LaserPrinter: crisper type and graphics than ever, thanks to sophisticated new Print Quality Enhancement Technology (PQET). There's



*The new IBM
LaserPrinters: the leading
edge, made sharper.*

more precise toner transfer than any LaserJet, and finer line weights. And fast, easy control-panel settings no LaserJet offers, for light/normal/dark print, and smooth or rough paper settings.

Right from page one, the new IBM LaserPrinters make everything from simple correspondence to slick desktop publishing look crisp, clean, and cutting-edge.

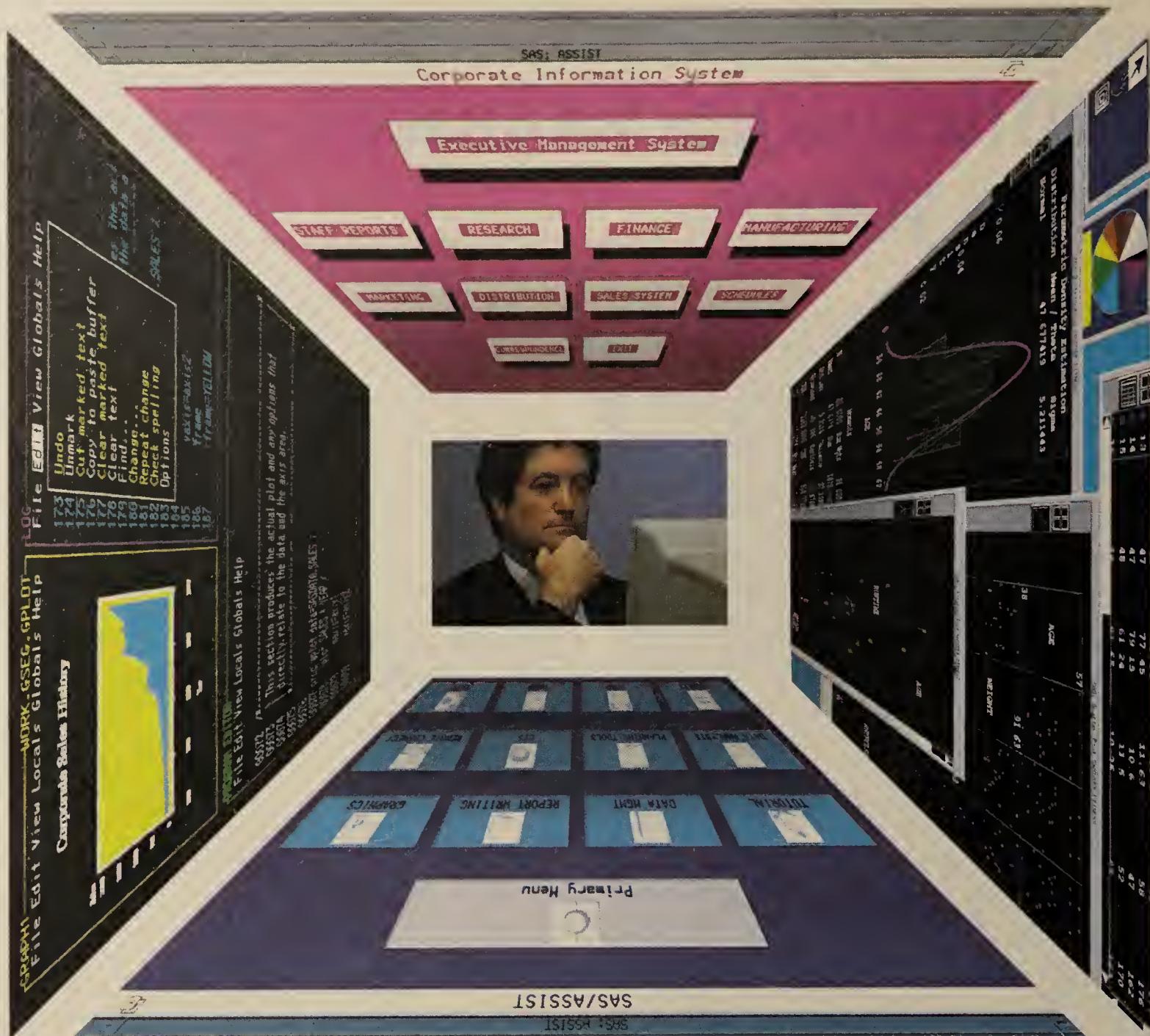
Which makes you look extraordinarily sharp too.

For your nearest dealer, call 1 800 IBM-2468, ext. 804. In Canada, call 1 800 465-1234.

LEXMARK
*Manufacturer and distributor of
IBM LaserPrinters.*

trademark of IBM Corp. in the United States and/or other countries and is used under license. Output produced with LaserPrinter 10 at 600 x 600 dpi. © 1991 Lexmark International, Inc.

PRINTERS. PAGES AHEAD.



No Matter How You Look at It

The SAS® System Brings Together Your Organization's Two Most Strategic Resources.

With the SAS System's multiple interfaces, it's never been easier to bring **people** together with the **information** they need. Your entire organization—from executive suite to factory floor—can command the power of the SAS System to access, manage, analyze, and present data.

Through customized executive interfaces, the facts that support strategic decisions are immediately at hand. Managers can use Executive Information System interfaces to monitor critical success factors, forecast trends, interpret financial performance, drill-down through departmental reports, and perform other essential tasks.

For business and technical analysts, there are task-oriented interfaces that drive a variety of applications through simple menu selections. Without having to know syntax or relying on MIS, analysts can manage projects, scrutinize market research data, monitor product quality, explore laboratory data, create graphs and ad hoc reports, and much more.

Programmers can put the SAS System's flexible fourth-generation language to work through an interactive windowing environment that displays programs

and output simultaneously—together with details about how the program is progressing. And, through an object-oriented applications development environment, programmers can link applications together to deliver virtually any information on any computing platform at any level of your organization.

Take a Closer Look.

For a free SAS System executive summary—with details about a no-risk software evaluation and our renowned technical support, documentation, training, and consulting services—give your Software Sales Account Manager a call at 919-677-8200. Also call to reserve your place at our free SAS System executive briefing...coming soon in your area.



SAS Institute Inc.
Software Sales Department
SAS Campus Drive
Cary, NC 27513
Phone 919-677-8200
Fax 919-677-8123

Trucking firm seeks faster dispatching

ON SITE

BY KIM S. NASH
CW STAFF

AUBURNDALE, Fla. — To help Comcar Industries, Inc. not only keep on truckin' but truck faster and more efficiently, the transportation company is taking the downsizing road.

Comcar, a holding company for eight trucking groups in the Southeast, recently started a one-year plan to convert its computer operations from a centralized, Unisys Corp. mainframe-based setup to a distributed scheme of several Unix-based Hewlett-Packard Co. HP 9000 midrange machines.

One of the motivations behind the switch is quicker, more accurate rig dispatching to customers such as The Coca-Cola Co., according to Mickey Fouts, chief financial officer and head of the steering committee in charge of the conversion.

"But we're also doing the rightsizing thing to better compete with the big guys," he said.

Fouts declined to reveal what the conversion will cost the firm, which pulled in \$200 million in revenue for 1990, but he estimated that the new operation will save Comcar about 20% in operating and maintenance costs over the current configuration.

Comcar's 12-member information systems staff will not rewrite any of the existing Computer Associates International, Inc. applications currently running on the company's Unisys

1100 70 series box or the home-grown ones on its VS15 mini-computer from Wang Laboratories, Inc., Fouts said.

Instead, they are buying a new set of financial packages tailor-made for the transportation industry from Concepts Dynamic, Inc., based in Schaumburg, Ill. Included in the deal are credit management, accounts payable and general ledger modules, all of which will run on the new HP 9000 Model 827S computers.

Comcar also bought a relational database and a fourth-generation language from Informix Corp. to help format and track financial information and generate quarterly reports.

In addition, the company will schedule trucking jobs for its 3,000 vehicles with a customized automated dispatching system, which tracks the de-

livery schedule, location and cargo for each truck in the eight offices. Tom McLeod Software in Birmingham, Ala., supplied the Loadmaster Transportation Management program.

Under the current mainframe-based system, when a customer calls to request a pickup or delivery, the operator must take down the pertinent details, such as what is to be picked up

when, then put the client on hold while he checks handwritten books that show the fleet's activities. In some cases, the material is not available, so the operator has to call the customer back.

But with the new software and HP terminals, "we'll be able to call all our information up in seconds," Fouts said.

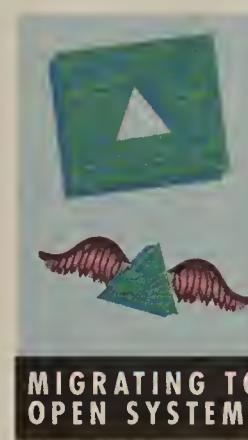
The X Window System is much easier to use than the command-line user interface of the

company's existing CA applications, he added, saying HP, Concepts Dynamic and Tom McLeod Software ran several "in-depth" dry runs of the new configuration. "It's easier to move from screen to screen, and the new software provides checks and balances to avoid mistakes," he said.

For instance, under the old system, if a dispatcher keyed an incorrectly formatted account number, the CA software would simply accept the wrong entry, but would "make you go through and manually find your mistakes" at the end of each accounting period, Fouts said.

However, the Concepts Dynamic package will indicate an error and automatically bring up a Help screen or a list of valid account types to choose from.

"All these seemingly small features allow us to instill more confidence in our customers," Fouts said. He estimated that Comcar will have all eight divisions up and running with the new systems by the end of 1992.



MIGRATING TO
OPEN SYSTEMS

Execs want EIS used companywide

BY SALLY CUSACK
CW STAFF

As the use of executive information systems (EIS) becomes more widespread across corporate America, end users and systems managers are evaluating different ways to maximize the data these systems were intended to provide to a small collection of upper level managers.

Bill Barnett, information center consultant and bank officer at the First Union National Bank of North Carolina in Charlotte, N.C., recently returned from an EIS user group meeting full of ideas on how to use the EIS to the bank's best advantage.

First Union has been using the Commander EIS from Comshare, Inc. on an IBM mainframe VM environment for approximately 1½ years. The system currently has 20 users, and that number will increase as the system "moves down" from executive row to incorporate those at the city branch managerial levels, Barnett said.

"The big issue at the user conference wasn't discussed officially, but it needed to be," he said, referring to the fact that users are finding EIS really helpful at levels beyond the upper echelons.

Initially, EIS was seen as being implemented in a horizontal band across the top of the organization, Barnett noted. But companies are finding that the software systems offer advantages to those at lower management levels.

For example, Barnett said, the bank is looking at incorporating many geographically dispersed sites onto the system to

share information. He added that there is no resistance to this from top management, except in the case of budgetary constraints.

Another Comshare EIS user, Leslie Frohlinger at Pfizer International in New York, concurred that the use of EIS software is spreading throughout the organization.

Pfizer uses the Commander EIS on the personal computer level in conjunction with Comshare's System W decision support integration system on an IBM 3090.

Frohlinger, manager of EIS at the firm, said that so far, user reaction has been good. The interface to the database is simple and requires minimal training, he said. "We started with a small group in one business division, and quickly added another two. Now we are going to add a corporate EIS for the controllers and financial personnel," he said, adding that 100 people currently access the EIS via local-area net-

works in different divisions. Pfizer initially installed the Commander EIS to service three of its international business areas by incorporating a database of financial, marketing and manufacturing information.

The initial three areas EIS services are: international pharmaceuticals; the specialty chemical business, which includes flavors, additives and fragrances; and the animal health business, which provides products such as antibiotics and feed supplements.

In addition to the planned EIS for corporate financial executives, Frohlinger said other areas of the company have expressed interest and are examining additional ways to use the EIS system.

The beauty of the EIS is that it can be used by anyone, Barnett said. "There were probably 1,100 users at the user group meeting, and there was a real mix of IS managers, developers and end-user coordinators."

NEW DEALS

Nestle plans AS/400 net

Nestle Enterprises Ltd. has awarded IBM Canada Ltd. and Syntax Systems Ltd. a contract with an estimated value of \$2 million to \$3 million. Under the terms of the agreement, Syntax's Distribution Management software will be implemented in all of Nestle's food service locations in Canada on a network of IBM Application System/400 midrange systems.

Marriott Ownership Resorts, Inc., a division of Marriott Corp., has installed a \$1 million Sequoia Systems, Inc. Series 300 fault-tolerant computer to increase the speed of its online computing and meet rapid growth requirements. The resorts division is using the Sequoia system to tie together operations in the U.S., Mexico and the Caribbean.

Factory MRP system, tools give Deere & Co. flexibility

CONTINUED FROM PAGE 27

be added later, as customer demand warrants, Manion added. Pricing for the system runs from \$200,000 to \$1 million.

Formerly run only on its proprietary parallel processor, CSI's software acts as a client to any host-based MRP II system and supports packages such as IBM's Copics, Ask Computer System, Inc.'s Manman, Dun & Bradstreet Software's Amaps and in-house developed systems.

The CSI planning system takes an extracted set of data from the host MRP II database and downloads it to the workstation via a high-speed data channel.

Once downloaded, the system "explodes," or analyzes the material and capacity requirement plans within seconds, enabling production planners to immediately see the material and labor impact resulting from any changes, Manion explained.

The same process on mainframes and minicomputers takes hours. At Deere's Waterloo factory, the largest of the company's 12 factories, the MRP runs are still conducted on the weekend because they take six to eight hours, Harmon said.

Now that the planning system is available on Unix-based platforms from IBM and HP, third-party vendors are likely to start lining up as resellers, said Bruce Richardson, vice president of research at Advanced Manufacturing Research, Inc., a market research firm in Cambridge, Mass. "CSI has got a really hot product area," he said.

The vendor also enjoys the luxury of having no serious challengers, with only a few competitors offering personal computer programs that download data from MRP systems. CSI's 20 customers, Richardson noted, "read like a list of who's who in large American discrete manufacturers." They include Northern Telecom, Compaq Computer Corp., HP, IBM, Pratt & Whitney, United Technologies Corp.'s Sikorsky Aircraft Division and General Electric Co.

One of CSI's clear advantages is the relatively quick installation of its software compared with traditional MRP systems, Richardson added. "These MRP systems take too long to install, and once you finally do it, the data is not accurate anymore," he explained. "CSI overcomes both of those problems because system installation takes an average of three months, and you can run MRP as often as you like. Clients characterize it as a very fast database that turbo-charges what you have."

Most companies will run MRP once a week because it "chews up so many CPU cycles," Richardson noted. "So rather than making accurate projections, you're mostly making seat-of-the-pants guesses."

Founded in 1984 as Cadence Computer Corp., CSI changed its name in March 1991 when it established a U.S. office in Boston and discovered the Cadence name had already been claimed by a computer-aided design software vendor.

Candle and our largest customer, IBM, are now partners in their International Alliance for SystemView.



...Investment security while expanding the *power* and performance of SystemView.

The Family of Candle Products:

- *Performance (OMEGAMON[®], OMEGAVIEW[™])*
- *Automation (AF/OPERATOR[®], AF/PERFORMER[™])*
- *Application Access (CL/CONFERENCE[®], CL/SUPERSESSION[®])*

Call 1-800-262-8968 to listen to the development announcement/analysis and to receive information.



OMEGAMON II® brings the *power* of SystemView to MVS performance monitoring.



OMEGAMON...the standard in performance monitoring
in over 7,000 data centers worldwide.

- Ease-of-use and clear understanding of MVS for everyone on the data center team through a CUA interface – the SystemView standard
- Comprehensive realtime and historical problem isolation, analysis and resolution to safeguard availability and response time
- Integrated with OMEGACENTER™ for total systems management

Call 1-800-843-3970 today and ask for Department 148 for more information on OMEGAMON II for MVS and SystemView.

Candle
Making your systems perform

NEW PRODUCTS — SOFTWARE

Development tools

Sterling Software, Inc. has announced that its Zim Application Development Environment will support major SQL databases.

The Zim Client/Server Release of Sterling's entity/relationship-based fourth-generation language is currently available for IBM's Database Manager. Future releases will support Microsoft Corp.'s SQL Server, Oracle Corp.'s Oracle and IBM's DB2 products. Zim offers 100% code portability, the company said.

Pricing starts at \$1,540 for a single DOS-based user license.

Sterling Software
5900 Canoga Ave.
Woodland Hills, Calif. 91367
(818) 716-1616

Applications packages

MacKinney Systems has announced DP Manager Release 1.2.

DP Manager runs on mainframe systems and allows administrators to track hardware and software inventory as well as change requests and problem reports. The new version offers simplified ease of use and requires fewer system resources.

Pricing is \$1,995 for VSE systems and \$3,000 for MVS systems. A version for

personal computers will also be offered.
MacKinney Systems
Suite 103
2740 Glenstone
Springfield, Mo. 65804
(417) 882-8012

Integral has announced Defined Contribution Manager, a human resources software package for managing employee contribution plans.

The product runs on midrange systems and handles stock bonus, 401(k), profit sharing and savings plans. It also interfaces with Integral's Human Resource Management System and other personnel/payroll programs.

Pricing starts at \$40,000.
Integral

2185 N. California Blvd.
Walnut Creek, Calif. 94596
(415) 939-3900

Utilities

Sequent Computer Systems, Inc. has announced new software for its Symmetry 2000 systems.

The Symmetry 2000 line includes Unix-based multiprocessor systems. The company announced enhancements for its Dynix/ptx operating system, including a backup utility (priced from \$2,900 to \$14,900), a high-performance disk system management utility (\$3,500 to \$17,500) and a transaction control utility (\$4,000 to \$30,000).

Sequent also announced a new X Window System display package and enhanced versions of its X.25 and Network File System products.

Sequent Computer Systems
15450 S. Koll Pkwy.
Beaverton, Ore. 97006
(503) 626-5700

HARDWARE

Processors

Locom Corp. has announced the availability of memory upgrades for IBM Application System/400 Models D35 and D45.

The LCM440-D upgrades are available in 8M-, 16M- and 32M-byte increments and include a lifetime replacement warranty. Pricing starts at \$2,800.

Locom
2350 Bering Drive
San Jose, Calif. 95131
(408) 435-1414

Sequoia Systems, Inc. has introduced a 256M-byte memory element for its fault-tolerant Unix systems.

The element is priced at \$199,000, lowering the cost per megabyte by approximately \$400 from previous Sequoia offerings, the company said.

Sequoia Systems
300 Nickerson Road
Marlboro, Mass. 01752
(508) 480-0800

Data storage

Decision Data, Inc. has announced new direct-access storage device subsystems for IBM midrange computers.

The subsystems offer instantaneous data transfer at 6M byte/sec. Average seek time is 8.7 msec. The controllers use multiple processors and a segmented buffering scheme to maximize I/O performance. Pricing starts at \$20,000.

Decision Data
1 Progress Ave.
Horsham, Pa. 19044
(215) 674-3300

Sigma Information Systems, Inc. has announced that the Catalyst 400 controller now supports Hewlett-Packard Co.'s 35480 3½-in. digital audio tape units.

The Catalyst 400 includes two tape drives and installs in any drive bay on the Digital Equipment Corp. VAX 4000 system. Total compressed storage capacity for the Catalyst 400 is 16G bytes.

The unit is priced at \$2,583.
Sigma Information Systems
5775 Polaris Ave.
Las Vegas, Nev. 89118
(702) 597-5111

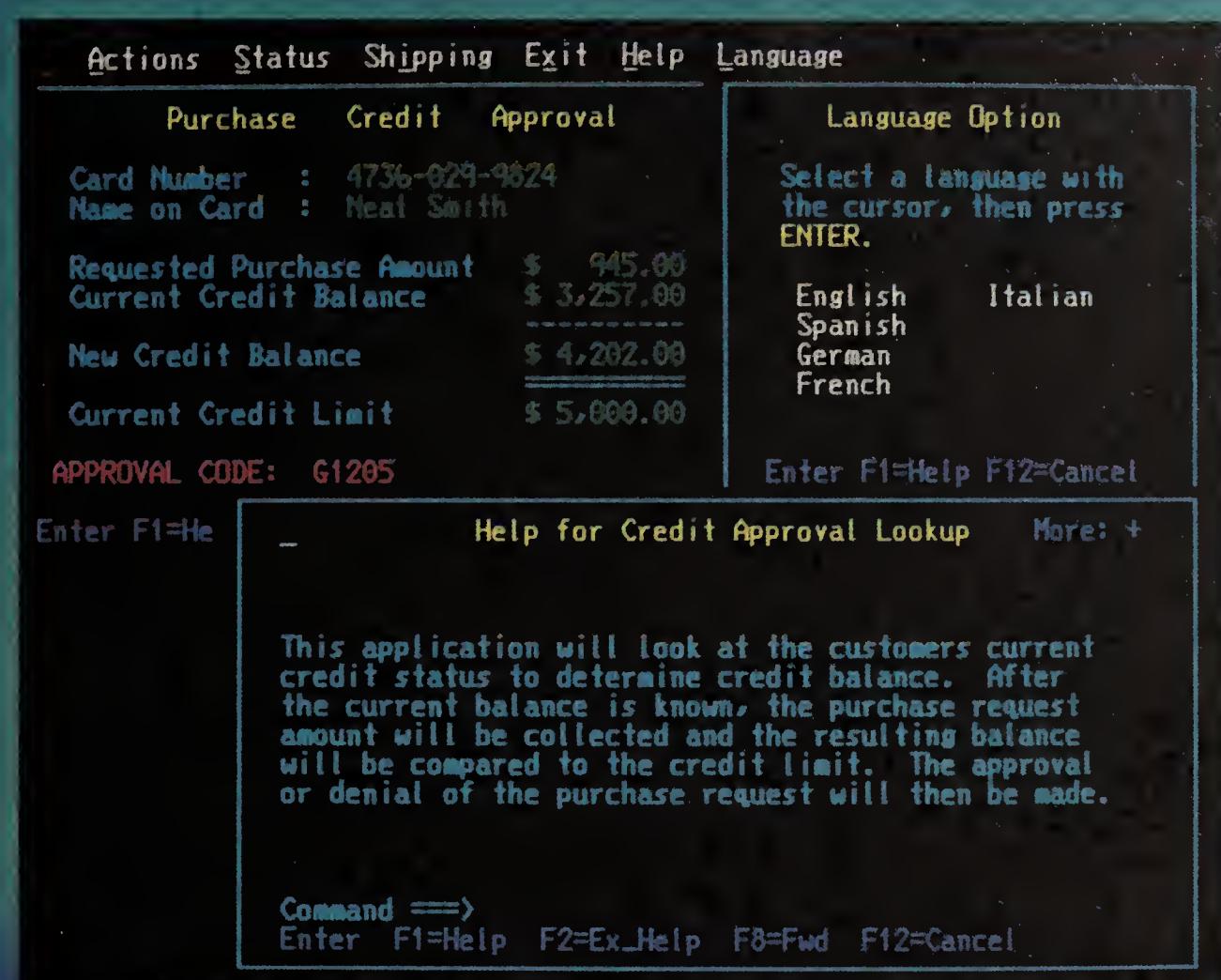


LEXMARK™

Manufacturer and Distributor
of Original IBM Toners.

IBM is a registered trademark of IBM Corp. in the United States and/or other countries and is used under license. IBM supplies are manufactured and distributed by Lexmark International, Inc. under license from International Business Machines Corporation. Lexmark is a trademark of Lexmark International, Inc. © 1991 Lexmark International, Inc.

Transform your 3270 into a powerful SAA/CUA workstation.



CL/SUPERSESSION: SystemView application access and more

- *Front-ending – SAA/CUA front-ends for existing applications*
- *Layering – Combine or distribute data between multiple applications from a single screen, with no additional hardware*
- *Maintenance – Extend the life of existing applications with help screens, pop-up windows, and action bars*
- *Access – Single point of network access for all users*
- *Management – Automate logons, keystrokes, repetitive tasks, and session switching ...all without changing source code.*

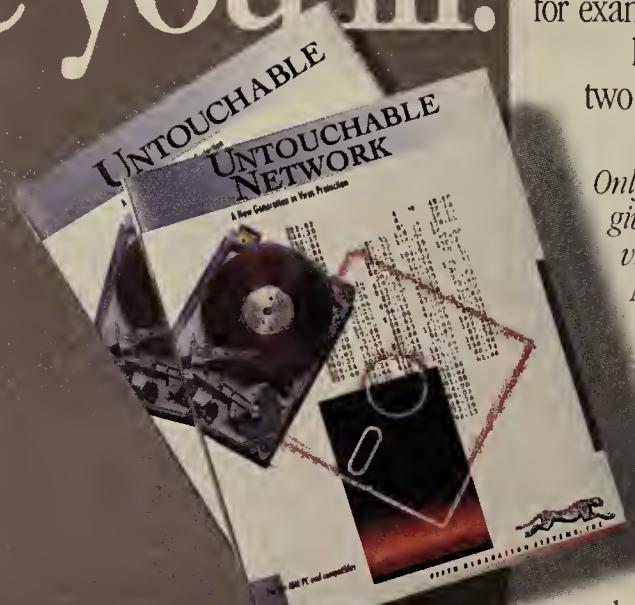
*Call 1-800-843-3970 today and ask for Department 520
for more information on CL/SUPERSESSION®.*



SystemView, CUA, and SAA are trademarks and IBM is a registered trademark of International Business Machines Corporation.
Copyright © 1991 Candle Corporation. All Rights Reserved.

Candle
Making your systems perform

Paying again and again for virus protection is enough to make you ill.



Frankly, paying anything at all is pretty nauseating.

But that's nothing compared to the feeling you get in your stomach when a drive full of data goes down the drain.

So you pay.

Then you pay again. For upgrades. Or quarterly "updates."

But even that doesn't buy you much peace of mind. Because each new day brings an average of six new viruses into the world.

Which means all anti-virus programs are inherently obsolete.

Except one.

Introducing Untouchable.TM The only software in the world that gives you 100% protection.

Today.

And tomorrow.

Like other anti-virus software, Untouchable is equipped with a TSR monitor for patrolling your system memory, plus a scanner/remover for examining the files on your disk.

Between them, these first two lines of defense can

Only Untouchable Network gives you centralized virus protection.

Now you can install, monitor and control without having to leave your seat.

recognize and obliterate hundreds of the little buggers — enough to protect you from 95% of the potential carnage.

If you find that statistic reassuring, then you probably like the odds in Russian Roulette.

If you don't, you'll want to

know that Untouchable is equipped with a unique *third* line of defense, which has been mathematically proven to be, well, untouchable.

Instead of looking for viruses, this third line of defense looks for *changes in your executable and system files*.

If the change is but a single byte, Untouchable will spot it and, using our patent-pending recovery technique, reconstruct the file to its original state.

The process is known as Generic Differential Detection, and certain other programs claim to perform it, too.

But only Untouchable calculates file signatures using not one, but two proprietary algorithms that can't be reverse-engineered.

Only Untouchable guarantees 100% safe recovery of infected files. (Unlike other programs that proudly generate corrupted files, Untouchable knows when the jig is up and doesn't attempt recovery.)

Only Untouchable can provide centralized network virus protection. In fact, Untouchable Network has enough virus alerts and reporting mechanisms to settle the stomach of even the most nervous Netware[®] administrator.

And only Untouchable is backed by our vaunted 24-hour toll-free technical support and a one-year money-back guarantee.

If you're worried about viruses — and you should be — don't reach for the Maalox.[®] Reach for the phone. Dial 1-800-926-4289 Ext. 55.

You'll feel better right away.

FIFTH GENERATION SYSTEMS, INC.



PCs & WORKSTATIONS

PC & WORKSTATION SHORTS

CD-ROM phone list

Nynex Information Technologies Co. and Metromail Corp. plan to produce a nine-volume set of compact disc/read-only memory (CD-ROM) discs containing over 77 million U.S. consumer and business telephone listings. Nynex has produced similar listings on CD-ROM for New York and New England. Metromail is a subsidiary of R.R. Donnelley & Sons Co.

Silicon Graphics, Inc.'s Iris graphics library recently picked up endorsements as a standard from six personal computer graphics companies. Artist Graphics, ATI Technologies, Inc., Hercules Computer Technology, Inc., Matrox Electronic Systems Ltd., Methus Corp. and SPEA, Inc. all backed Iris as a programming interface for interactive three-dimensional graphics.

Wordstar International, Inc. has announced a bundling deal with PC vendor Cumulus Computer Corp., which will package the Wordstar for Windows word processing package with selected Cumulus GLC and Workbox computers.

BY CAROL HILDEBRAND
CW STAFF

As Microsoft Corp.'s Windows gains ground in the 1990s, software applications are going to mirror this switch, getting prettier, louder and more object-oriented, industry observers said. Users, however, are not as concerned with feature-rich as much as support-reliable.

A recent PC Expo '91 discussion on where software is heading in the next decade highlighted the age-old truism that

vendors' blueprints do not always reflect user concerns. Executives from Adobe Systems, Inc., Macromind, Inc., Lotus Development Corp. and Borland International, Inc. outlined their product directions.

The vendors vociferously emphasized how their applications would best take advantage of the booming new graphical environment, with most development currently on Windows. From Macromind's Scott Walchek, who predicted that point-and-click voice annotation to docu-

ments would become popular, to Adobe's John Kunze, who was forecasting that document communication was the wave of the future, it was clear that graphical development is high priority for vendors.

Future hype

Although the future was filled with Windows hype, the audience's plans for the new operating environment on the block were less sanguine. When the audience was polled on its plans to switch to Windows by 1995,

the air did not exactly fill with eagerly waving hands.

While the vendor spokesmen predicted a 50% to 60% switch-over by the mid-1990s, less than half of the approximately 300 people present responded positively to the same question.

Mary Lou McPherson, an information technology specialist at Michigan State University, said that for her, software that worked together smoothly regardless of vendor was an important issue. An Aldus Corp. Page-

Continued on page 48

Calif. college takes graphic approach to ease of use

ON SITE

BY JAMES DALY
CW STAFF

STOCKTON, Calif. — For all the lip service given to how easy personal computers are to use, most folks still cringe when they first sit down in front of one. Instructions are often deficient, command sequences can be cryptic, and that perennial boogeyman — the innate fear that somehow, some way you will accidentally erase all of your data — feeds on the confusion.

Information systems managers at San Joaquin Delta College were presented with just this sort of challenge when creating a PC system that would give the college's nearly 500 faculty and staff members — most of whom had little or no PC training — easy access to a wealth of mainframe data. The IS managers

also needed to preserve the school's existing informational infrastructure: a Unisys Corp. B6930 mainframe, three Digital Equipment Corp. VAX minicomputers, nine file servers and 170 Apple Computer, Inc. Macintosh computers.

Their solution was simple: Why not make the information available on the campuswide network as easy to access as a folder in a filing cabinet or a letter in a

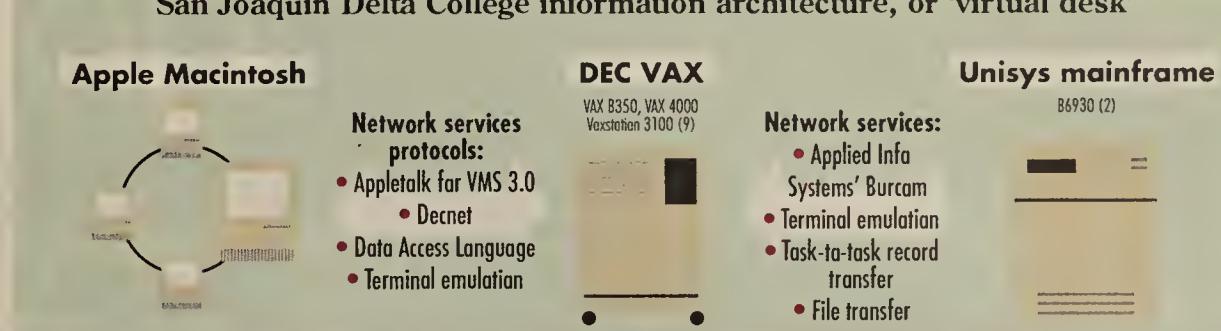
stack of mail?

The result is the Virtual Desk, a revamp of the Macintosh's graphical user interface that puts a small drawing of a tidy business office on the screen. To see the latest budget information, for instance, a user clicks open a file cabinet drawer and pulls the appropriate folder. Future appointments can be checked by accessing the calendar on the wall or pulling mail

from a neat pile of envelopes. Users can even tell when it is time to go home — the sun in the office window sets and the lights of a distant city skyline blink on.

Matt Rosen, assistant director for technical services, said the guiding principle of the Virtual Desk was that users would require virtually no training to feel comfortable with it.

"Most folks aren't interested
Continued on page 49



CW Chart: Janell Genovese

Micro Focus brings 370 Assembler to the PC!

The Micro Focus 370 Assembler is a tool which helps maximize the productivity of both the mainframe Assembler programmer as well as the COBOL programmer whose application calls Assembler subroutines.

Micro Focus 370 Assembler allows PC development and maintenance of host based Assembler and mixed COBOL/370 Assembler applications when used with Micro Focus COBOL/2 Workbench. The full featured Assembler programming environment includes:

- Macro Processor
- Assembler
- Linkage Editor
- Run Time Facility
- Interactive Debugging Facility

MICRO FOCUS

A Better Way of Programming™

- ☞ Rapid Macro processing and Assemblies
- ☞ Reduced Host dependency and turnaround
- ☞ Reduced development time
- ☞ Interactive 370 Assembler debugging
- ☞ Support for the full IBM 370 and 370 XA instruction set
- ☞ Reduced mainframe resource utilization

For more information about the Micro Focus 370 Assembler or about other Micro Focus products call **1-800-872-6265** or **415-856-4161**.

Backup. For people who don't.



Everyone who uses a PC ought to back up regularly. But most people don't back up at all.

In fact, if the people in your company are like those at most other companies, about the only way you're going to get regular backups out of them is to do it without them.

Guess what?

Now you can.

Now you can set up fully automatic, unattended backups for every PC in the house.

What's more, you can easily customize the nature and timing of each one to suit *your* requirements.

And transform a simple, effective company-wide backup policy from fantasy into fact.

All you need is Fastback Plus 3.0.

The latest version of the world's most popular backup software comes complete with a backup policy of its own — in the form of pre-designed scheduling templates — that you can adapt with our unique Macro Editor.

What makes our Macro Editor unique?

It uses plain English commands. Which means you can actually use it.

Using Fastback Plus on your PCs is very much like using Fastback Plus for the Macintosh® — same interface, same functionality.

Same backups, even.

That's right. You can actually restore a Mac file directly onto a PC, and vice versa.

Nobody else can do that.

But then, nobody else can back up more than 3MB per minute on an AT. Or up to 10MB per minute on a '386.

And no other program is backed up by our vaunted 24-hour toll-free technical support.

There's more. So pick up the phone. Dial 1-800-926-4289 ext. 55.

And tell everyone to stand back.



F I F T H G E N E R A T I O N S Y S T E M S , I N C

Data access tool creates multiplatform links

BY CHRISTOPHER LINDQUIST
CW STAFF

BURLINGTON, Mass. — Dimensional Insight, Inc. has announced Microsoft Corp. Windows and Unix versions of its object-oriented free-form data access and analysis tool, Crosstarget.

Information used by the system comes in through a "data integrator" that accepts raw data and formats it for use. The raw data is then compressed, indexed and stored by a "builder," which creates links between data that can then be accessed by Crosstarget. In this way, no links

EACH PIECE of information on the screen, right down to a dot on a scattergram, is an object that has other data attached to it.

have to be preconceived and programmed before the system can be used. Users simply "dive" into the data and can click on any data item to retrieve more information about it.

"You don't have the inhibition of having to wait for someone to structure the data for you," said Stephen McClure, senior consultant for new software technologies at International Data Corp. in Framingham, Mass.

Jack Ward, a project manager at Codex Corp. in Mansfield, Mass., said he finds this freedom useful for analysts reviewing sales data, such as intersections of products, customers and distribution. "It's very, very slick," he said. "I think [Dimensional Insight] has caught on to something."

Ward said Codex currently uses the product on a monthly

basis but is looking to move to a weekly program. About 400,000 records are run through the "build" program in about two hours on a Digital Equipment Corp. VAX system.

He said the build could be performed on an Apple Computer, Inc. Macintosh, but it took about 12 hours on an FX model. He indicated that the rate at which builds could be performed would allow the application to be used much more frequently than it is now, however. "With the speeds that it runs at, you could even use it on a daily basis," he said.

Reducing paper

Another benefit of Crosstarget, Ward said, is cutting down on paper use. "We're trying to eliminate all of the paper reports," he said. Crosstarget lets analysts sift through data on-screen using a mouse, rather than sorting through the 1½-ft-high paper output looking for a single piece of information.

Crosstarget allows users to view their data in a variety of forms, such as charts, graphs and scattergrams. Each piece of information on the screen, right down to a dot on a scattergram, is an object with other data attached to it.

For example, clicking on a bar in a bar chart might call up the sales figures for an office. Clicking again could call up a breakdown of sales by product or by salesperson. "It's one of the most object-oriented interfaces that I've seen," McClure said. "Very impressive."

The package is available for Macintosh, Windows and the Open Software Foundation's Motif platforms. It can be run in either stand-alone or client/server environments.

Pricing depends on platform and environment and ranges from \$1,500 to \$4,500 for client/server versions and \$1,000 to \$8,000 for stand-alone versions.

PCs fit suit maker perfectly

Clothier makes custom patterns with computerized measuring program

ON SITE

BY CAROL HILDEBRAND
CW STAFF

As the saying goes, a stitch in time saves nine, but in the case of clothier Albert Andrews Ltd., computers are weaving time savings and improved quality into the fabric of the business.

Albert Andrews makes custom-tailored suits for businessmen who lack the time for shopping and subsequent fittings — but with a new wrinkle: The Boston company uses computers to take the measurements and to aid in cutting the material.

Albert Andrews, located on tony Newbury Street, one of Boston's premier areas for upscale clothing, custom makes men's suits from about 10 basic designs.

These designs range from the traditional Brooks Brothers-like look to the more exaggerated styles affected by trendier makers, with nipped-in waists, padded shoulders and peak lapels.

Established by Andrew Kotlikoff and Andrew Stern — grandson of Zayre Corp. founder Max Feldberg — the company boasts about 900 customers and hopes to expand via franchises across the country. A Hartford, Conn., location is already in the works.

Office calls

Customers can come into the company's showroom for a fitting, but the hallmark of Albert Andrews is that the company makes house — or office — calls.

In a routine that takes about 15 to 20 minutes, a company representative uses a computerized tape measure and an instrument that resembles an architect's T square to take more than 40 measurements, such as the slope of the shoulder, sleeve length and so on.

The representative presses a button on the measuring instrument that automatically enters

the number into a laptop computer running custom-made software.

The measurements go into



Albert Andrews Stern takes portable PCs and computerized tape measures on the road

great detail to ensure the quality of the fit, Stern said. For example, the way a person stands — arms forward, shoulders back, whatever the case — has an effect on how the sleeve of a suit should be set into the shoulder.

Once entered into the laptop, the measurements are used to create a custom pattern, which, barring any severe weight gain or loss, can be reused every time a client wants to order a suit.

Customer measurements are then sent via modem to the company's Cleveland manufacturing facilities, where they are used to create the custom pattern. The fabric is cut by laser, using the

electronically created pattern, and then assembled by hand at the factory. According to Stern, it takes about four weeks to create a suit using measurements that are accurate to within 1/1,000th of an inch.

Stern said that more often than not, the suit requires no further fitting once it is delivered from Cleveland. And when alterations are needed, in many cases, they are necessitated by human frailty rather than mechanical mismeasurement, he said.

"While the suit is being manufactured in Cleveland, the body could be eating pasta in Boston," Stern said.

Using computers for measurement has saved both the company and its clients time and money. A customer has to be measured only once. After that, he can literally order a suit by phone.

The reduction in alterations streamlines the amount of time needed to get a finished product out the door and frees up Albert Andrews representatives to make more first-time calls, as opposed to alteration follow-ups.

Price still low

The company is also able to offer an attractive price point for a custom suit. While a customer can spend thousands for a suit, the entry-level price is about \$450, comparable to an off-the-rack suit, Stern said.

The company is currently at work on a software upgrade, as well as investing in new laptops — probably 80386-based IBM-compatibles, Stern said.

The software will add in new factors designed to help representatives in the field more correctly divine what a customer wants and whether it is workable for the particular body type in question.

"Sometimes, what a customer wants and what he really needs are not the same thing," Stern said.

XDB: DB2 Development on the PC.

Thousands of companies have migrated their DB2 development from the mainframe to the PC using XDB-Workbench.
What do they know that you don't?



It Saves. Why use expensive mainframe CPU cycles for development that could be done faster and more easily on the PC? XDB-Workbench lets you develop and test COBOL programs with embedded SQL on your PC.

It Works. If your application runs on XDB-Workbench, it will run on DB2. No compromise. No expensive application recoding needed. The XDB-Workbench provides complete DB2 functionality on your PC.

It's Proven. XDB-Workbench is now the DB2 development standard for the PC. Proof is in the numbers. Over 20,000 XDB-Workbench installations are off-loading DB2 development to the PC today. XDB works perfectly with both Micro Focus COBOL/2 Workbench and Realia COBOL for complete DB2 application development.

CALL (301) 317-6800

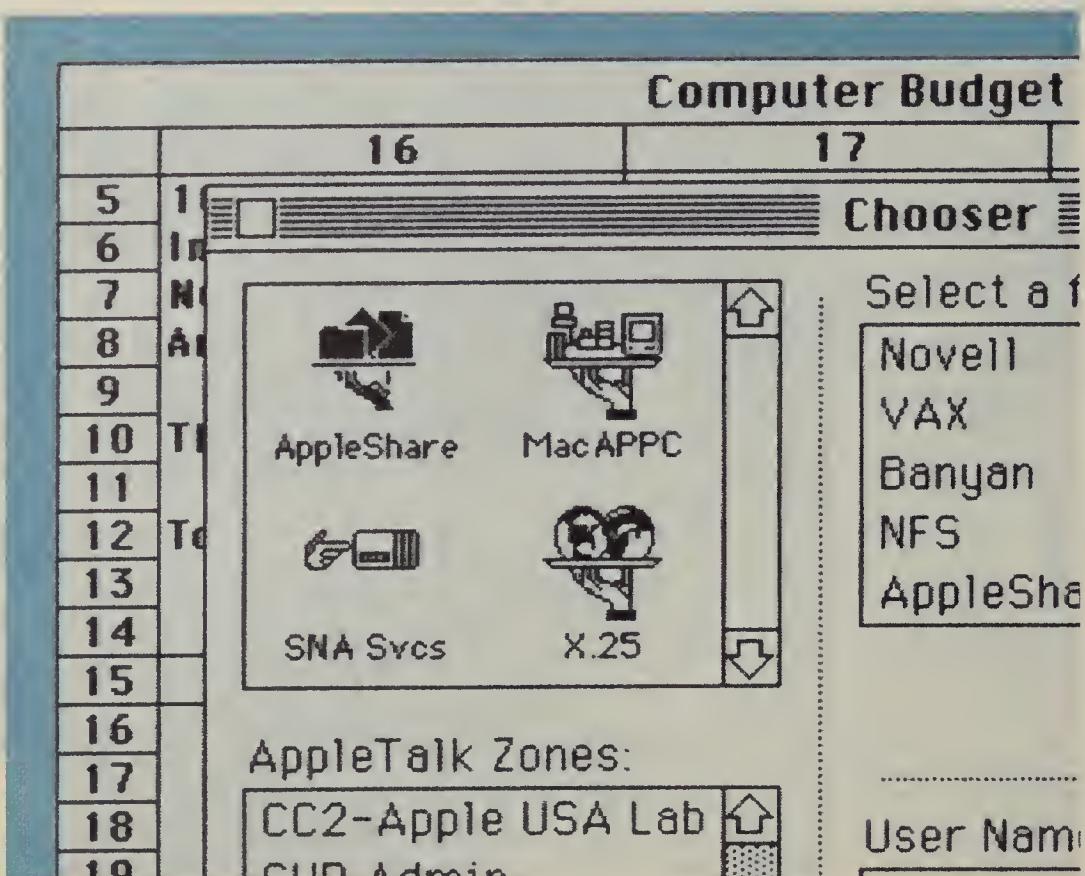


XDB Systems, Inc.

14700 Sweitzer Lane, Laurel, MD 20707

NEW RELEASE
2.41

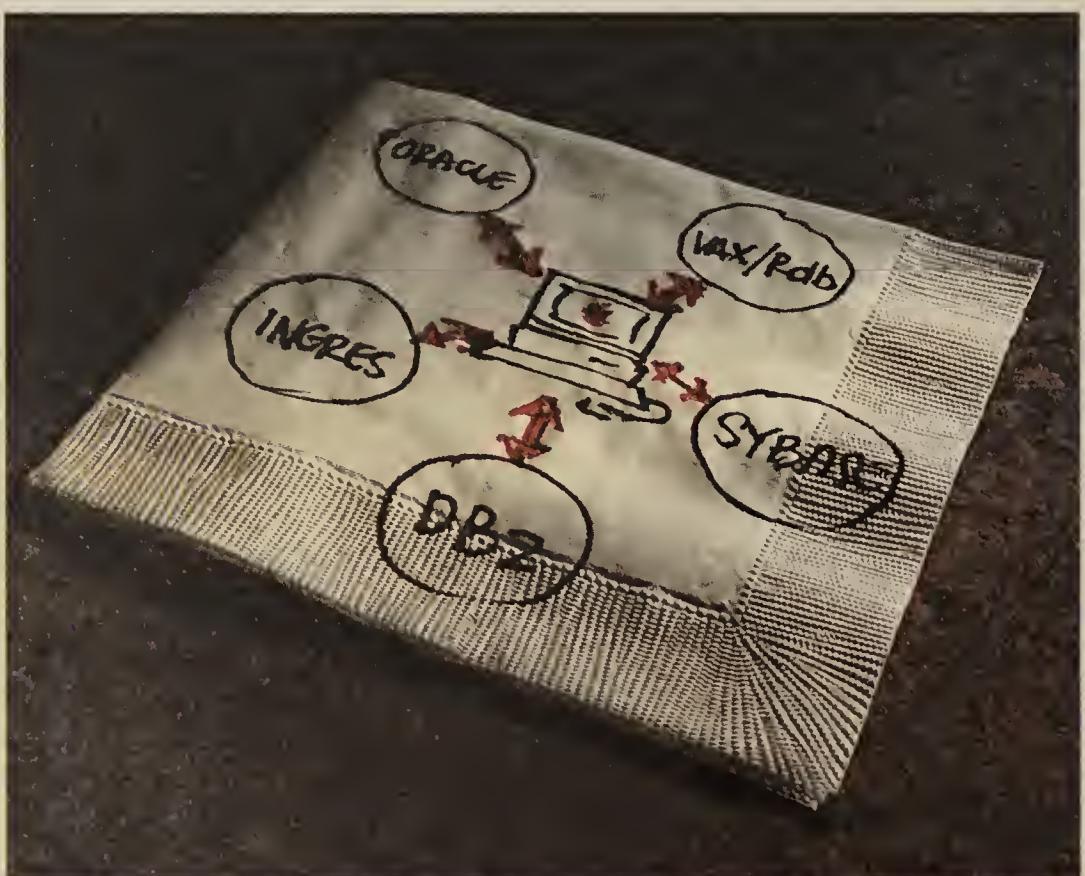
We're open



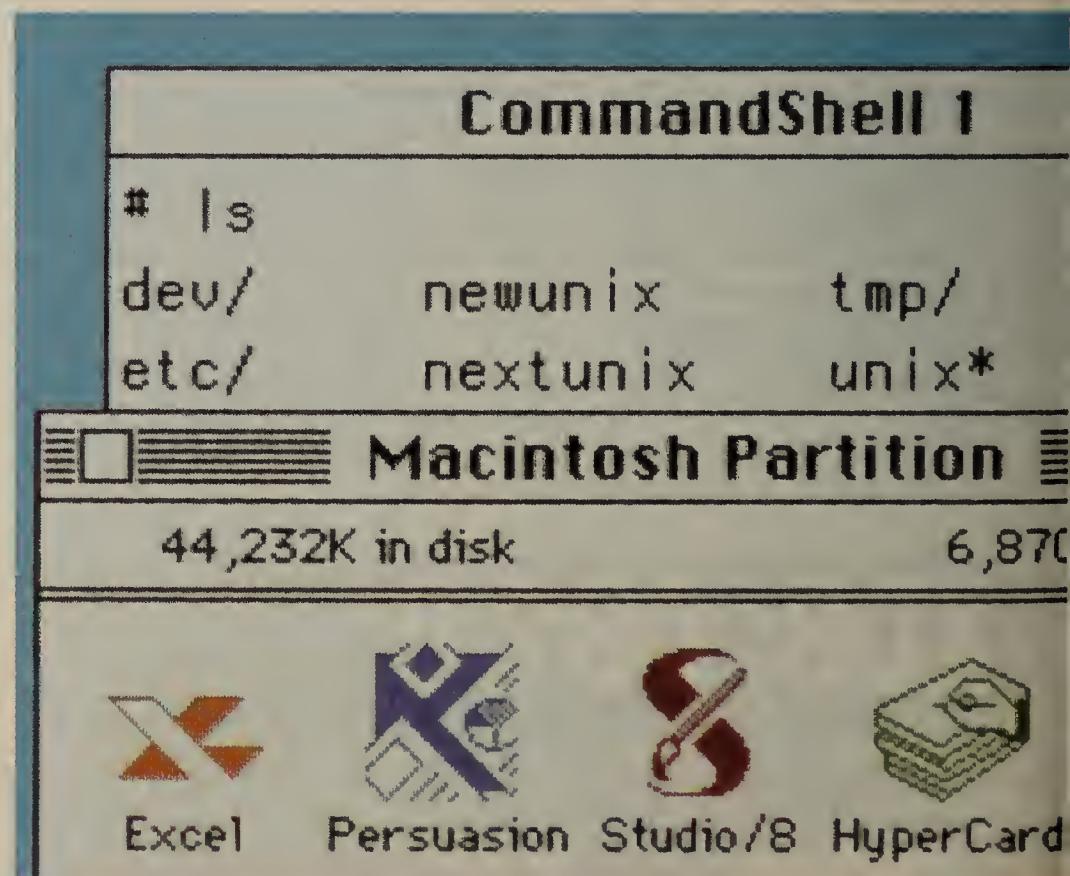
This is the Macintosh Chooser. A single point of access to a wide range of systems. The Chooser shows available network resources graphically and consistently. Just point the mouse and you're connected.



Macintosh offers an incredible range of tools for connecting with virtually any host-based environment, whether it's running SNA, TCP/IP, DECnet™, or OSI.



Apple's Data Access Language (DAL) adapts popular off-the-shelf database, spreadsheet, and data analysis software to major SQL environments. So nontechnical users can easily access remote databases.



Apple A/UX® lets Macintosh run UNIX® applications plus thousands of Mac® programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more.

Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

But lately, a lot of people are finding the source of their solution a pleasant surprise: the Apple® Macintosh® computer.

They're finding that Macintosh comes out of the box with sophisticated networking capabilities designed right in.

That Macintosh is open to virtually any host, any file server, or any database, through any network.

That Macintosh makes the desktop the place where diverse systems come together.

And that with Macintosh you can build systems that let even nontechnical users access information from the desktop, no matter where that information resides.

And because Macintosh works with all your networks, databases, and hosts in one consistent and graphic way, it delivers major savings in implementation and training.

In short, Macintosh gives you the power to make information systems more valuable to the people who use them. The power to be your best®.



Macintosh gives people a single, simple view of the information and services that can help them do their jobs and serve your organization. See for yourself. Call 800-635-9550, ext. 555, and we'll send you a free video showing how Macintosh helps unify complex systems.





Wordperfect combines strong features, GUI

Wordperfect's Wordperfect for Windows

| Reviews | Performance | Ease of use | Editing | Output | Windows compatibility | Documentation | Service and support | Value | Overall |
|--|------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------|---------------------|---------------------------|---------------------------------|
| <i>InfoWorld</i> 10/7/91 | NC | Linear formatting but no snags | No graphics editor for objects | Easy to manage | Decent | NC | NC | Impressive | Hits the target |
| <i>PC Magazine</i> 11/12/91 | NC | Powerful file manager | Matches DOS version | Better print drivers | Looks like a native to Windows | NC | NC | Raises competitive stakes | Breathtaking depth of features |
| <i>PC World</i> 11/91 | A mite slower than DOS | More flexible and fun | Formatting can be a headache | Graphics viewer offers preview | Not all smooth | NC | NC | Worthwhile upgrade | Well worth the wait |
| Users | | | | | | | | | |
| Robert Duncan, The Cheetah Co. | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | Smooth transition |
| Thomas Scott Maiden, IBM | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | Great graphics, poor outlining |
| Charlene Riffle, Amoco Oil Co. | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | Love the WYSIWYG |
| Analysts | | | | | | | | | |
| Ronni Marshak, Patricia Seybold group | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | NC | ■■■■ | ■■■■ | Easy switch from DOS to Windows |
| Peter Francis, Dataquest, Inc. | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | A year late but worth the wait |
| Amy Wohl, Wohl Associates | ■■■■ | ■■■■ | ■■■■ | ■■■■ | ■■■■ | NC | NC | ■■■■ | A strong product |

Key: ■■ Very good ■■ Good ■■ Fair ■■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment.

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Although Wordperfect Corp.'s Wordperfect for Windows is not dramatically different than its DOS predecessor from a functional point of view, the long-awaited popular word processor combines the powerful features of its DOS version with the convenience of the Windows environment. The result is a program that meets the needs of longtime Wordperfect users looking to migrate to Windows as well as Windows users looking for a flexible, full-featured word processor.

Performance: Graphical applications are by nature slower than DOS-based applications, so if users expect Wordperfect for Windows to run as quickly as Wordperfect for DOS, they are bound to be disappointed. However, with enough hardware — a 80386SX with 4M bytes of memory — it keeps up with other Windows

Vendor financial information

Wordperfect Corp. in Orem, Utah, is a privately held company with 2,812 employees. The installed base of users of its DOS products is about 8 million worldwide. Sales for October 1991 increased by almost 50% compared with sales in October 1990, according to the company. Total 1990 sales of \$425 million increased 61% over 1989 sales of \$281 million.

word processors.

Ease of use: The interface is well-designed and flexible, letting users choose either IBM Common User Access menus and keyboard layout or the traditional Wordperfect for DOS commands. There is a customizable button bar and a ruler that lets users select fonts, styles, tabs and line spacing with a mouse click.

Editing capabilities: Wordperfect for Windows is almost identical to Wordperfect for DOS in terms of functionality. There is a default what-you-see-is-what-you-get mode, a draft mode for faster editing and a reveal codes mode that lets users see all the formatting commands in the docu-

ment. Document files can be transferred between Windows and DOS versions of Wordperfect, and a utility lets users convert all but the most complex macros. However, reviewers said, the program does not always take full advantage of the graphical user interface. Also, there is no collapsible outlining.

Output capabilities: Output features shine in Wordperfect for Windows. Users can insert graphics, tables and text boxes anywhere in a document. They can import graphics files in a number of formats and resize and otherwise manipulate them. However, there is no graphics editor for creating objects.

Windows compatibility: In addition to such interface features as the button bar and the ruler, Wordperfect for Windows supports Dynamic Data Exchange and the ability to open as many as nine documents at a time, and it has an integrated Windows file manager that can also be run as a stand-alone application.

Documentation: Wordperfect goes a bit overboard in its written documentation, including details that most users will probably never need.

Service and support: Wordperfect is well-known for listening and responding to customer needs.

Value: Wordperfect for Windows makes it cost-justifiable to make the move from DOS to Windows. It provides full-function editing with superb graphics and output capabilities, all within the easy-to-use Windows environment. Wordperfect for Windows costs \$495. Upgrading from Wordperfect for DOS is \$125.

Wordperfect responds

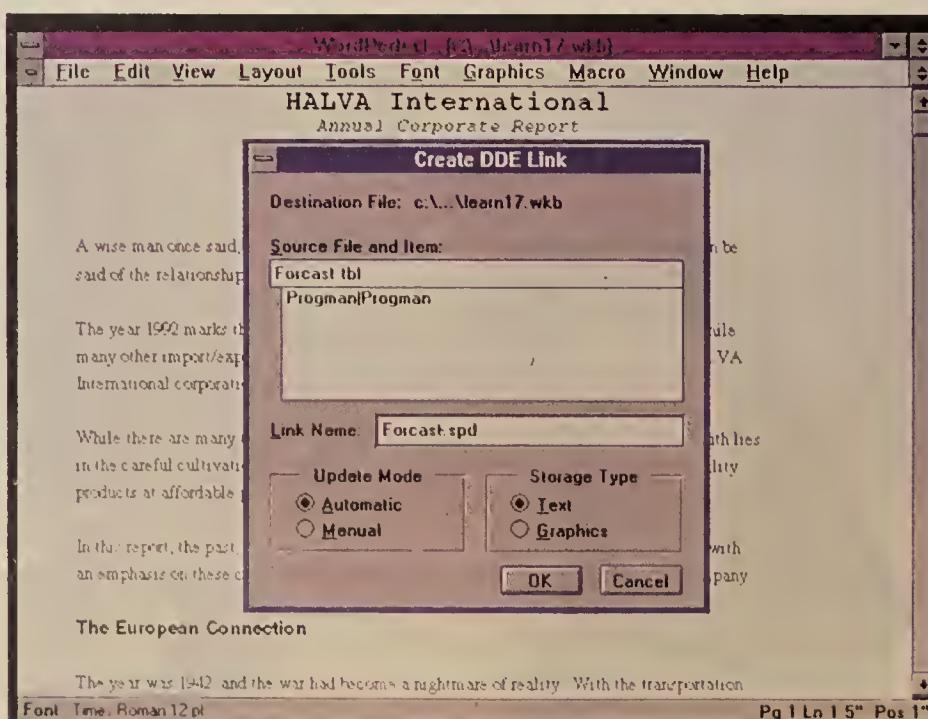
Devin Durrant, director of marketing for Wordperfect for Windows and for OS/2:

Performance: We tell our customers that to take full advantage of the product, they must have a powerful enough system. For many users, this is their first graphical application, so we are stressing the importance of sufficient hardware to minimize lack of performance compared with a character-based program. (The recommended system is a 386SX with 4M bytes of memory.)

Ease of use: We have tried to make the transition from DOS to Windows smooth, at the same time giving our users the freedom to choose between traditional Wordperfect for DOS functionality and Windows functionality. Once people learn it and get used to it, they will not find it confusing or inconsistent.

Editing capabilities: We are happy with our outliner. Look for enhancements such as collapsible outliner capabilities in future product releases.

Output: Regarding a graphics editor for creating objects, this too may be included in future releases.



Wordperfect for Windows combines the powerful functions of its DOS version with the Windows environment

NEXT WEEK

► Reviewers say that Wordstar for Windows is easy to use with advanced layout, while Ami Pro has impressive features but may be overly complex.

We Can Sum Up Our Competitors' Approach To I-CASE In Two Words:



Face it, I-CASE hasn't lived up to expectations.

That's because its one-size-fits-all and hyperintegrated dogma promotes excessive rigidity and limitations, and fails to take into account the real world scenarios developers encounter.

At INTERSOLV, experience has taught us that you can't build applications in a hyperintegrated and closed environment. Our unique solution—the benefits of I-CASE, but with a modular implementation approach that reduces up-front costs and risks—takes into account the true realities of the 1990's development environment.

In short, our solution works because it gives you full lifecycle coverage and all the functionality you need without forcing you to change your culture and projects to fit a rigid model tool set. Our LAN-exploited products—Excelerator for Analysis and Design, APS for Application Generation, PVCS for Configuration Management and Design Recovery for Re-Develop-

ment—work standalone, together, or can be "snapped" into your current culture.

Add to that our commitment to an open architecture and adherence to industry standards such as IBM's AD/Cycle, and you have the flexibility needed



to ensure on time, on target delivery of high impact IS solutions.

Ask our customers. There are over 100,000 who count on us every day. They'll tell you how our approach opens up a world of possibilities for them.

For more information on the right solution, and a free copy of a management report entitled, "I-CASE In An Open Architecture: Increasing ROI, Reducing Risk," write: INTERSOLV, 3200 Tower Oaks Boulevard, Rockville, Maryland 20852. Or call 1-800-547-4000 ext. 9201.

I-CASE
In An Open
Architecture:
Increasing
ROI,
Reducing
Risk

INTERSOLV

The CASE Company You've Been Waiting For.

INTERSOLV, Excelerator, Design Recovery, APS and PVCS are registered trademarks of INTERSOLV, Inc. IBM is a registered trademark and AD/Cycle is a trademark of International Business Machines Corporation.

THE OPEN ADVANTAGE OF DOING BUSINESS WITH A DIGITAL AUTHORIZED DISTRIBUTOR.

© DIGITAL EQUIPMENT CORPORATION 1991. THE DIGITAL LOGO IS A TRADEMARK OF DIGITAL EQUIPMENT CORPORATION.

D I G I T A L . T H E O P

Digital's Authorized Distributors are open to doing business the way you want to.

They carry a wide range of Digital's open computing products and provide value-added services to customers nationwide. And, because of extensive inventories, they offer quick delivery. Since they are closely aligned with Digital, the Distributors' sales and technical people receive the same training as Digital's own people. That means you can count on complete quality, service and support.

To learn more, look in the Yellow Pages under Digital for the Authorized Distributor nearest you.

Almac/Arrow Electronics
14360 S.E. Eastgate Way
Bellevue, WA 98007
800-426-1410

Anixter Bros., Inc.
4711 Golf Road
One Concourse Plaza
Skokie, IL 60076
800-232-0190 x693

Avnet Computer
10950 W. Washington Blvd.
Culver City, CA 90232
800-426-7999

Computer Datacom, Inc.
15221 Barranca Parkway
Irvine, CA 92718
800-334-2020

Computer Systems Corp.
5540 Rockhampton Court
Indianapolis, IN 46268
800-428-0714

Impact Marketing Systems
11 Industrial Way
Salem, NH 03079
800-345-1110

Inland Associates
15021 West 117th Street
P.O. Box 940
Olathe, KS 66062
800-888-7800

I0CS, Inc.
400 Totten Pond Road
Waltham, MA 02254
800-451-1033

MTI Systems
25 Hub Drive
Melville, NY 11747
800-645-6530

Pioneer Standard
4800 131st Street
Cleveland, OH 44105
800-874-6633

Pioneer Technologies
15810 Gaither Road
Gaithersburg, MD 20877
800-227-1693

Rawson & Company, Inc.
2010 McAllister
Houston, TX 77092
713-688-8126

Systems Management American Corporation
254 Monticello Avenue
Norfolk, Virginia 23510
804-627-9331

Total Tec Systems, Inc.
2 Gourmet Lane
Edison, NJ 08837
908-906-6500

Trilogic Corporation
R.D. #2 Box 203A
Cannonsburg, PA 15317
800-346-2933

WESCO
One Riverfront Center
Pittsburgh, PA 15222
412-642-3563

Wyle Laboratories
15360 Barranca Parkway
Irvine, CA 92718
800-332-6995



E N D A D V A N T A G E.

New Ingres/Windows draws positive response

BY JEAN S. BOZMAN
CW STAFF

The drive to shift the Ingres Corp. relational database management system toward a client/server architecture moved one giant step forward late last month with the extension of key applications development tools to more platforms, Ingres users and industry analysts said.

The enhancement of Ingres/Windows 4GL and Ingres/Vision by Ask Computer Systems, Inc.'s Ingres Products Division brought both tools closer to deployment across a wide range of Ingres-supported platforms. Ingres/Windows 4GL, the 18-month-old graphical user interface (GUI)-based development kit, can now be launched on Microsoft Corp. Windows 3.0 machines, for example, while the character-based Ingres/Vision can now be used in Unix and PC-DOS environments.

Before this announcement, Ingres/Windows 4GL was available only on Unix computers and on Digital Equipment Corp. VAX machines; Ingres/Vision had been available on VAXs but not on Unix workstations or personal computers. The limited choice of platforms was frustrat-

ing for many users.

"Ingres/Windows 4GL was developed for a single-database environment, and there was no cross-compatibility," said John Dunkle, a senior analyst at Workgroup Technologies, Inc. in Hampton, N.H. "But many users wanted to use the same tool set to address many Ingres databases, no matter where those databases might be in the enterprise."

Both products will be available on a dozen Ingres platforms by March, Ingres executives said. "We know it will be a big benefit to our users if we enable them to develop on one platform and deploy on another," said Kathleen Hession, a server

programs manager at Ingres. "It also allows them to implement client/server across heterogeneous platforms with the same products."

Analysts and users said the news was proof that Ingres had responded to user complaints about limited availability. "A lot of my customers are building large networks of PCs," explained Eric Palmer, an Atlanta consultant who is president of the North American Ingres Users Association. "Now, Ingres/Windows 4GL applications can run in Microsoft Windows, and yet the [Ingres] data can reside somewhere else on a shared Unix server."

Another consequence of the Ingres/

Windows 4GL extension is that developers can build Ingres-based GUI applications on low-cost PCs rather than on expensive Unix workstations. Users that adopt that approach will have to acquire two PCs, Palmer said. One would run OS/2 and act as an Ingres database server, while the other PC or IBM Personal System/2 would be the software developer's workstation.

Ingres/Vision, which supersedes the 9-year-old Application by Forms, will provide a forms-based development environment for character-based applications. Ingres said it will continue to sell Application by Forms to those users that request it, however. Ingres/Vision and Ingres/Visionpro will prompt users through menu choices, Ingres said.

Vendors, users go different ways

CONTINUED FROM PAGE 39

maker program that can grab information from any database, for example, or a graphics package that converts any data to pictures, would be of interest, she said.

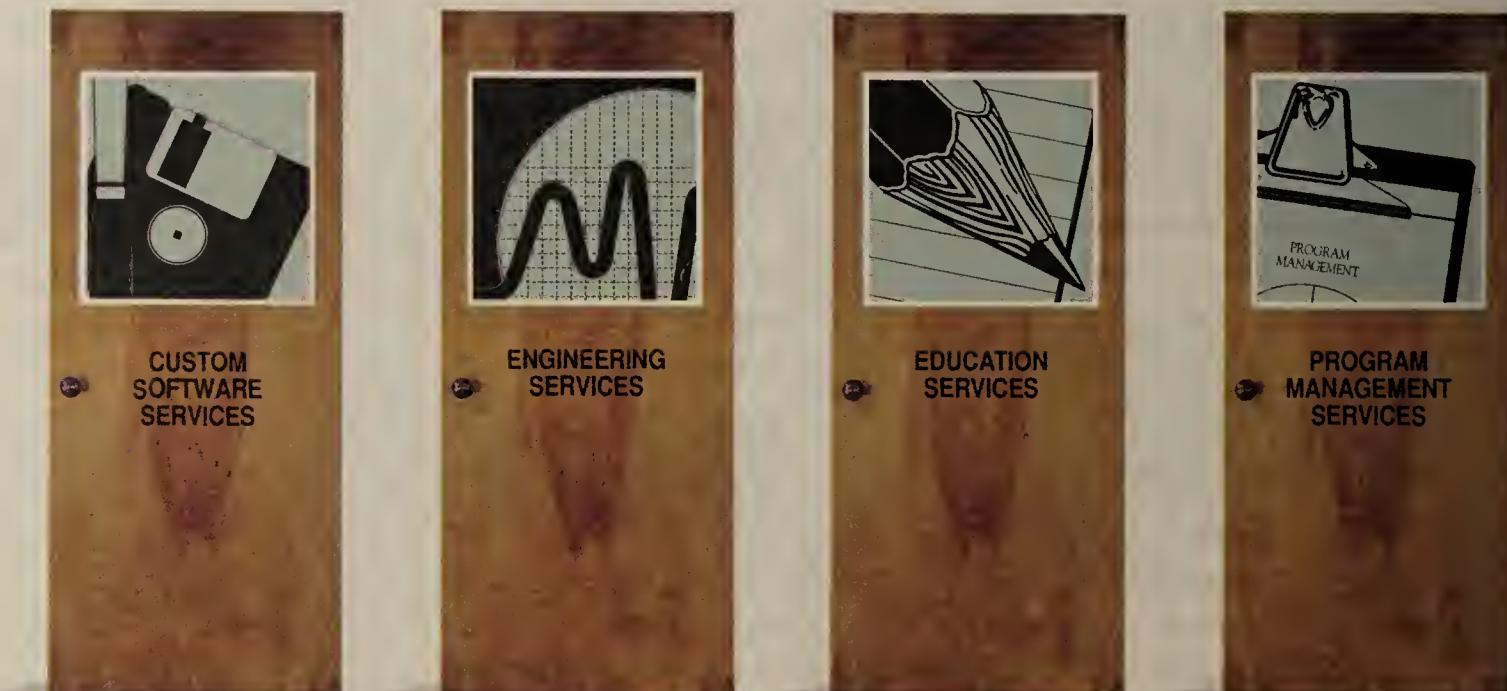
Object orientation will gain in importance. Lotus spokesman Said Mohammadioun said it will enable faster turnaround on product upgrades by enabling the company to break a Windows application into manageable parts. In an application, for example, different segments of a graph can be clicked on as separate objects to get more information, said Borland's Marshall Mosely.

Users seemed more concerned with how they are going to get their present products to work more smoothly than in what direction those products were headed. Service and support drew some debate. The vendors ran into a stone wall when they queried the crowd on whether they would be willing to pay extra for service and support. Of the few that said they would, all the hands went down when it was proposed that the suggested annual support price in question could go over \$100. As one user commented when the audience was surveyed about whether they would be willing to pay extra, "Well, only if we get [financial] credits every time we have to hit the Help key."

McPherson said that while she was sensitive to the vendors' comments, she took them with a grain of salt. "They're interested in bucks. I want products that work," she said.



Lotus' Mohammadioun: Object orientation on rise



Today's departmental computing demands customized solutions. "Off-the-shelf" packages simply cannot deliver the functionality required in mission-critical applications. ERI Custom Software Services is your single source for customization and enhancement of databases, GUIs, operating systems, imaging, office automation, and other software-related integration issues.

ERI Engineering Services offers expert network analysis, consulting, design, configuration, installation and certification. We have vast experience with multiple systems, platforms, networks and software. Our designs match business and budget requirements, leverage existing technologies, and offer flexibility for future needs.

Customized training by ERI Education Services means higher retention rates, increased employee confidence and productivity, and a better return on technology investments. Programs may be held on-site or at ERI UNIVERSITY, our state-of-the-art educational facility.

Use ERI Program Management Services to coordinate or control all your integration requirements. We can be an extension to your staff, or take complete responsibility for the entire project. Either way, we manage the tasks you would otherwise have to handle yourself.

Networking 'integral part' of Windows NT strategy

Ballmer insists Microsoft will still support LAN Manager

BY ELISABETH HORWITT
CW STAFF

CAMBRIDGE, Mass. — Networking will be "an integral part" of Microsoft Corp.'s upcoming 32-bit Windows New Technology product, which is due out sometime next year, according to Steve Ballmer, the vendor's senior vice president of systems software.

Ballmer spoke here at the recent Forrester Research, Inc. annual technology forum.

Windows NT, as it is called, was designed to work with a variety of network environments; indeed, Novell, Inc. has already committed to developing a Netware requester for NT, he added.

Ballmer contradicted rumors and an earlier statement by Forrester that Mi-

crosoft was preparing to or will eventually abandon support for LAN Manager, which requires OS/2. Microsoft, of course, is pushing Windows and offers only limited OS/2 support these days.

The network operating system forms "an important part" of Microsoft's strategy, Ballmer said. LAN Manager for Windows NT will ship about the same time as the high-end Windows offering will ship, and the price will range from \$400 to \$600. The product will "complement, not replace, DOS," he said.

Object-oriented system offered

Another project in the works at Microsoft is Windows Advanced Services, a new object-oriented information storage system that targets the network server market,

according to Ballmer.

The server was designed to provide file, compound-document, electronic-mail, directory and configuration information accessible to a variety of client systems and "popular applications" across a network, he added. However, while "pieces of it will become part of Windows over the next few years," introduction of the full product is still a long way off, Ballmer said.

Windows 3.0's installed base will reach approximately 7.5 million by the end of this month, Ballmer said, out of an installed base of 96 million Microsoft DOS users. Windows shipments will total 7.8 million units next year, according to International Data Corp. — or eight to 12 million, according to Microsoft.

Our Services Is ur Reach. ystems Integration From ERI.



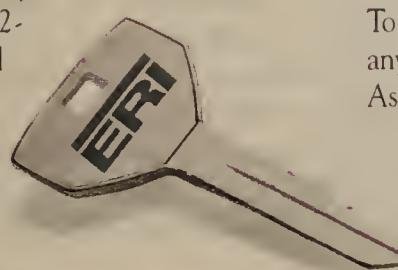
Customer Support Center Services include the AnswerLine for fee-based technical assistance; System Load And Test (SLT) for "burned-in" systems; Maintenance programs such as OEM/Third-Party plans and ERI-Stacking for replacement of failed equipment; and ERI's Help Desk Start-Up Service for resolution of "lower-level" technical issues.



Financing through ERI is your best protection from technological obsolescence. While third-party financing is irrevocable, ERI permits upgrading without penalty. Flexible plans include 12- to 60-month leases and monthly rentals. And you can finance our professional services as well as equipment.



For improved departmental productivity, ERI is your key to the services you need. And as the nation's leading full-service systems integrator for NCR and Sun Microsystems, we'll stand behind you with our Systems Assurance Guarantee. To learn more about our Guarantee or any service, call (800) 222-1050. Ask for Dept. X.



NCR

Authorized
Systems Integrator



Value
Added
Reseller

ERI

Answering your needs today.
Anticipating your needs for tomorrow.

Corporate Headquarters:
180 Vanderbilt Motor Parkway, Hauppauge, NY 11788-9682

(800) 222-1050 Fax (516) 435-0995

All names, products and services mentioned are the trademarks or registered trademarks of their respective organizations.

College takes graphic approach

CONTINUED FROM PAGE 39

in training, don't have time for it or even have access to training facilities," Rosen said. "We wanted a system where you could sit down at the PC and five minutes later be accessing information all over the campus."

The Virtual Desk can access a wide array of information, including departmental budgets, student records and university policies. "The beauty of the Virtual Desk is that users don't need to know the location of the data or the type of database in which it resides," Rosen said. "They just click on an icon that represents the data they want to access."

The Virtual Desk was built using as much off-the-shelf software as possible, Rosen noted. IS personnel turned to the Claris Corp. Hypercard for creating the database interfaces. The Hypercard data files, called stacks, give users instant fingertip access to information that previously required sifting through layers of database subsets.

The Business Summary Stack, for instance, takes the equivalent of a financial summary report and puts it on a series of eight Hypercard stacks, each representing a different account type, Rosen said. The information is updated each evening. With the click of a button, college administrators can find out the current cash position of the college.

The Virtual Desk not only eliminates reams of paper but also provides information that was unavailable when data was stored exclusively on the mainframe. For example, administrators can use the Dean's Grade Viewer stack to learn not only what services are used by which of the school's 25,000 students but also whether the students who use these services are more successful academically.

Customized on-screen drawings are a snap. Each Virtual Desk object has also been implemented as a stand-alone tool, so users can easily add, create and delete tools depending on their needs.

The Virtual Desk is part of San Joaquin's five-year plan outlining the future of information services at the 55-year-old college. The project has already paid for itself, Rosen said, based on the fact that enrollment at the school has increased more than 30% in recent years with little additional support staff. "You could say it's something we'd prefer not to live without," he said.

COMMENTARY

Jesse Berst

Applications as tool kits



In a recent column, I discussed corporate development tools for Windows and Presentation Manager. Graphical user interface programming is getting easier every day thanks to an avalanche of top-notch programming tools.

Today, I'm going to tell you why you may not need those tools. You may have a powerful applications development environment sitting in your office already, disguised as a word processor or a spreadsheet. Many of today's Windows programs include macro languages that are so robust you can use them to construct industrial-strength, line-of-business applications.

Consider, for instance, the remarkable Excel-based executive information system (EIS) that Otis Elevator set up with the assistance of Clearwater, Fla.-based consultant Gus Evans. According to Evans, Otis Elevator managers can access a database of 40,000 reports without leaving Excel. Using macros, Evans programmed a new Excel menu choice that acts as a doorway into the EIS.

To executives, the reports look like printed presentations. However, since they are Excel spreadsheets, the company's financial analysts can use them to examine trends and try out scenarios.

Evans and Otis Elevator took advantage of the fact that today's embedded macro tools let you change the appearance and function of the program.

"Applications go together much more rapidly because you're using a high-level language," Evans says. He cites a C-based menuing system that took several months to build. The same system was re-created in one week with Excel macros.

That doesn't mean you can expect end users to build a complex system. "The people who do the best job are still those with a programming background," Evans says. "They know how to make systems faster, safer and easier to use." But once a system has been built and debugged, power users can maintain it.

When you use an application as a development platform, you don't have to build all the functionality from scratch. Instead, you have the simpler job of customizing and extending an existing product. And because more Windows applications have embedded tools, you can start with the package best suited to your needs — spreadsheet, word processor, graphics, telecommunications or other.

Still, using embedded macro tools has drawbacks. Macro languages don't have the power of general-purpose tools or direct access to the system application programming interfaces. "Fortunately, most macro languages have ways to extend functionality. You can write a small program in C and access it with the macro language," Evans says.

You'll also pay a performance penalty, although, Evans claims, "an experienced macro programmer can put the

system together so you get performance penalties measured in seconds. But if you're not careful you can get penalties measured in minutes."

Also, although many applications have embedded macro tools, each is an "island of programmability." Cross-application tools and techniques are still quite primitive.

Despite their limitations, embedded macro tools deserve serious attention. I say that not just because of the great work that is being done right now but also because of what lies ahead.

For instance, Microsoft has promised to include a macro language in all its major applications. It has also committed to merging the syntax of these languages with that of its Visual Basic. Learn one

and you've learned them all. Lotus, Borland and others are taking similar steps.

It's going to get even better because Microsoft is building a Basic Engine into Windows. Once it's in place, you'll be able to access this engine in three ways. First, you'll be able to record and modify macros inside applications. Second, you'll be able to use a new tool called the Macro Manager to edit macros with a form of "programming by example." Finally, power users and programmers will be able to read the macros into Visual Basic, where they can be modified and extended.

In addition, the Macro Manager will be able to control more than one application at a time. It will bridge and connect the "islands of programmability." You'll soon be able to build custom applications

by using the Macro Manager to stitch together off-the-shelf applications. Although Hewlett-Packard's New Wave (a Windows extension) has some of these capabilities today, the Macro Manager will bring them into the Windows mainstream.

It's an enticing prospect that should be here by this time next year. But don't wait until then to investigate this technique. Companies all over the country are using it right now to shave months off development cycles and thousands of dollars from programming budgets.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

IBM presents the that brings



If you're a glutton for productivity, chances are you're considering open systems solutions for your business. But much of the menu is so unfamiliar or limited, it's enough to make you lose your appetite.

The IBM RISC System/6000™ family of POWERstations and POWERservers is for you. It's as open an open system as you'll find anywhere, to help you take a big bite out of communication barriers. With the RISC System/6000, you offer your suppliers and customers broad connectivity and management for IBM and non-IBM networks. And you also satisfy your hunger for the latest leading-edge technology.

without network or equipment upset.

Naturally, the RISC System/6000 family supports all major industry standards. And it also runs a smorgasbord of over 3,500 key applications. But that's only the appetizer. This family provides the widest range of binary compatible systems, so you're free to put the right level of machine performance and price at every location.

The RISC System/6000 also serves up remarkable performance, capacity and value. The POWERserver 550 runs at speeds you'd expect from a supercomputer, but runs up a tab starting at only \$58,000. And

*Prices subject to change. Dealers' prices may vary. IBM and AIX are registered trademarks and RISC System/6000 is a trademark of International Business Machines Corporation. UNIX is a registered trademark of UNIX Systems Laboratories. HAGAR THE HORRIBLE Character(s) © 1991 King Features Syndicate, Inc. © 1991 IBM Corp.

Untouchable gives enhanced virus protection

BY CHRISTOPHER LINDQUIST
CW STAFF

Fifth Generation Systems, Inc., the Baton Rouge, La.-based personal computer software utility vendor, has announced Untouchable, virus protection software that does not require the use of virus "signature" files to identify and remove viruses.

Untouchable uses a method of virus removal that guarantees complete recovery of infected files, even those that have been attacked by unknown viruses. The product will also be available in a network version that provides centralized protection of networks.

The product uses a "file scanner" that produces a signature of files on the disk rather than relying on the signature of a virus for detection, eliminating concerns that modified viruses might bypass protection. Untouchable stores the file signatures in both on-line and off-line databases and can rebuild damaged files using the information stored in these databases.

Untouchable includes a memory-resident monitor that scans files before execution for known viruses. The monitor occupies 900 bytes of memory if loaded into expanded memory or 5K bytes if loaded into conventional memory.

The product also includes a virus scan-

ner/remover that can locate and remove more than 600 known viruses.

The network version of Untouchable includes features such as centralized automatic installation, real-time virus alerts, continuous status reports and historical logs of status reports and virus activity. It will be available for Novell, Inc. Netware, Microsoft Corp. LAN Manager, Banyan Systems, Inc. Vines and other network operating systems. The stand-alone version of Untouchable is available now, with a list price of \$165. The network version is scheduled for release this month with a list price of \$695, which includes the server license and 10 node licenses.

Positive laptop breaks \$1,800

BY MICHAEL FITZGERALD
CW STAFF

CHATSWORTH, Calif. — A small 2-year-old company is selling a notebook computer based on Intel Corp.'s 20-MHz 80386SX chip for \$1,800.

Positive Corp. will sell its 6½-pound PC Positive 320N with 2M bytes of random-access memory, a 40M-byte hard drive and a bundle of Microsoft Corp.'s DOS 5.0, Windows 3.0, Works for Windows and the Microsoft Productivity Pack for \$1,799.99. The 320ND, with 4M bytes of RAM, a 60M-byte hard drive and a modem designed for 9.6K bit/sec. facsimile operation and 2,400 bit/sec. data transmissions, as well as the Microsoft software bundle, sells for \$2,399.99.

Positive distributes through some 200 membership discount clubs, where only members are entitled to shop. It said it is the leading supplier of personal computers through this distribution channel.

Bryan Kerr, executive vice president of Positive, termed the pricing a shot across Compaq Computer Corp.'s bow (a Compaq LTE 386S/20 configured in similar fashion, without the software, has a street price of close to \$3,000).

Everex releases modular PCs

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Everex Systems, Inc. continued its efforts to regain profitability recently by releasing a family of modular personal computers.

Dubbed the Tempo M series, the modular, or easily upgradable, design puts Everex squarely on the buzzword bandwagon with numerous other vendors. Some observers have stated that modular systems will be de rigueur in the future.

The Tempo M series uses a passive backplane design that allows users to upgrade a machine from an Intel Corp. 25-MHz 80386DX chip to a 50-MHz 486 chip by pulling out a 32-bit CPU card and replacing it with another. The design also supports both Weitek Corp. and Intel math coprocessors, and the card for the 486SX CPU has an extra socket for future Intel chips.

The Tempo M series will support up to 32M bytes of random-access memory and has an Everex proprietary 128K-byte cache built in. It also offers 512K bytes of video memory for faster graphics.

Pricing on the M series, which includes both large and small footprints, ranges from \$1,899 for a 386/25 with 1M byte of RAM to \$3,999 for the top-of-the-line 486/33 with 4M bytes of RAM. The upgrades range in price from \$699 to upgrade from a 386/25 to a 386/33, to \$1,999 to upgrade from a 386/25 to a 486/33 (pricing includes return of the original processor board). The M series began shipping last week, save the 50-MHz 486, which Everex promised would ship in the first quarter of 1992.

first open system more to the table.



other models' prices start below \$14,000*

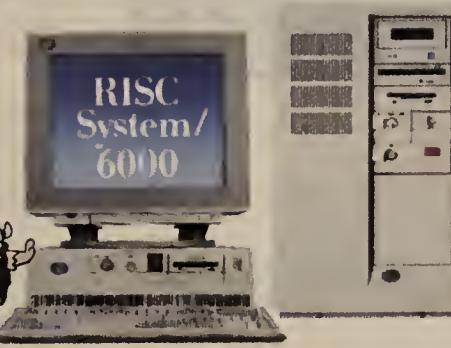
AIX® the pièce de resistance. To make UNIX® even easier to swallow, there's AIX, IBM's UNIX operating system. AIX makes it a piece of cake to develop company-wide networked solutions. And it gives companies robust operating software for enterprise-critical applications.

Service with a smile. The RISC System/6000 comes with something you won't find anywhere else—the unparalleled support of IBM. Service 24 hours a day,

For the Power Seeker.

365 days a year. But then, at IBM, customer service and support aren't just fillers. They're your just desserts.

To find out more about the IBM RISC System/6000, contact your IBM marketing representative or Business Partner. For literature, call 1 800 IBM-6676, ext. 824.



NEW PRODUCTS

Development tools

Outrider Systems, Inc. has released two software tools for use with Microsoft Corp.'s Visual Basic.

Buttontool allows developers to place graphics symbols and captions on on-screen buttons. Included are 18 predefined symbols. The tool also creates shadows and three-dimensional effects when a button is depressed.

Edittool performs input field masking, defining the type of characters or strings that can be placed in an application input field.

Both programs load into the Visual Basic palette. Each costs \$49.95.

Outrider Systems
Suite 1196
3701 Kirby Drive
Houston, Texas 77098
(713) 521-0486

Optibase, Inc. has announced the availability of Optitools 3.0, an upgraded multimedia software development kit.

Optitools 3.0 allows users to integrate third-party multimedia applications with the Optibase Model 100 and 500 programmable image compression/expansion add-in boards. Compression and expansion performance is enhanced in the new version of the software, which also includes color subsampling, a new image processing library and a file-size prediction feature.

Optitools 3.0 costs \$795.

Optibase
7800 Deering Ave.
Canoga Park, Calif. 91304
(818) 719-6566

Nantucket Tools II has been announced by Nantucket Corp.

Nantucket Tools II is a library of programming extensions for users of the company's Clipper 5.0 development system. It includes over 550 new functions divided into 17 categories for reference. New tools include multiple window customization, multiple output effects for character strings and color palettes, disk utilities and specialized network functions.

The product is priced at \$695. Upgrading from Clipper Tools I costs \$195.

Nantucket
12555 W. Jefferson Blvd.
Los Angeles, Calif. 90066
(213) 390-7923

Peripherals

Rapid Technology Corp. has announced the Visionary real-time compression board for personal computers.

Visionary provides 30 frame/sec. compression and playback in conjunction with the company's Visionary Video YUV frame grabber board. The combination allows users to display video images played back from the PC's hard disk. The Visionary products comply with Joint Photographic Experts Group standards, the

company said.

Visionary costs \$1,695. The Visionary Video card is priced at \$1,295.

Rapid Technology
Suite 43
Amherst Commerce Park
4226 Ridge Lea Road
Amherst, N.Y. 14226
(716) 833-8533

Texas Instruments, Inc. has announced a series of reduced instruction set computing laser printers.

The Microlaser Turbo printers include 9- and 16-page/min. models. Both models include 2.5M bytes of memory and 35 resident Adobe Systems, Inc. Postscript fonts.

The 9-page/min. version is priced at \$2,249; the 16-page/min. model costs \$3,649.

Texas Instruments
12501 Research Blvd.
Austin, Texas 78759
(512) 250-7407

Data storage

Quadram Corp. has announced its 25M-byte very high density floppy subsystem for the Apple Computer, Inc. Macintosh.

The Quadflextra offers an average seek time of 35 msec. and data transfer rate of 1.25M byte/sec. Formatted capacity for each 3½-in. disk is 20.4M bytes.

The subsystem with four disks costs \$895. Additional disks cost \$25 each.

Quadram
1 Quad Way
Norcross, Ga. 30093
(404) 923-6666

The G-Force 040 costs \$2,799.

Great Valley Products
600 Clark Ave.
King of Prussia, Pa. 19406
(215) 337-8770

Compuadd Computer Corp. has announced a "stretch chassis" design for its line of personal computers.

Systems with the new design offer additional drive space and incorporate a video controller with 512K bytes of memory on the local bus, improving video performance, the company said. A higher capacity power supply (200W) is also included to handle more add-on devices.

Pricing for the new models starts at \$1,295 for a 16-MHz Intel Corp. 80386SX-based system with a 40M-byte hard drive.

Compuadd Computer
12303 Technology Blvd.
Austin, Texas 78727
(512) 250-1489

Gateway 2000 has announced an Extended Industry Standard Architecture personal computer based on the Intel Corp. 33-MHz I486 processor.

The system includes 128K bytes of cache memory, 8M bytes of random-access memory, a 340M-byte hard drive and a monitor. It offers eight expansion slots and a small computer systems interface controller.

The system costs \$3,895.

Gateway 2000
610 Gateway Drive
N. Sioux City, S.D. 57049
(605) 232-2000

Database management systems

Information Management Systems, Inc. has introduced Dataflow, a database software utility for personal computers running DOS.

Dataflow allows users to view, format, search and sort files in Borland International, Inc.'s Paradox and Dbase formats as well as ASCII files. Files in different formats can be opened concurrently in Dataflow windows. Files can also be linked regardless of format.

The product offers a number of data manipulation commands including Find, Select, Split and Join.

Dataflow costs \$89.95.

Information Management Systems
Suite A-5
15760 Ventura Blvd.
Encino, Calif. 91436
(818) 784-6890

Objective Solutions, Inc. has announced a version of Orin for the Microsoft Corp. Windows environment.

Orin is a relational database application development system. According to the company, it is compatible with databases from Oracle Corp., Informix Software, Inc. and Digital Equipment Corp. and builds applications for multiple hardware platforms. Orin provides a graphical environment and an optional object-oriented procedural language.

Orin runs under Windows, DOS, Unix and VMS. The Windows version costs \$1,295, and the price of character-based versions has been reduced to \$795.

Objective Solutions
Suite 106
17 Hibiscus Blvd.
Melbourne, Fla. 32902
(407) 676-0279



Tecmar's Minivault drives conform to QIC-40 and QIC-80 standards

Tecmar has announced the Minivault, a ¼-in. cartridge tape backup system with up to 250M-byte capacity.

Minivault drives conform to industry QIC-40 and QIC-80 standards, the company reported. The 120M-byte internal model is priced at \$395, and the 250M-byte model costs \$519.

Tecmar
6225 Cochran Road
Solon, Ohio 44139
(216) 349-0600

Systems

Great Valley Products, Inc. has unveiled a Motorola, Inc. 68040 accelerator for Commodore Business Machines, Inc.'s Amiga 3000 and 3000T systems.

The G-Force 040 board runs at 28 MHz and can be configured with 4M or 8M bytes of random-access memory. It also includes separate 4M-byte caches for data and instructions.

According to the company, the board provides performance of 22 million instructions per second. It offers a fallback mode for full backward software compatibility.

Find new business partners in the fastest-growing market in Asia!

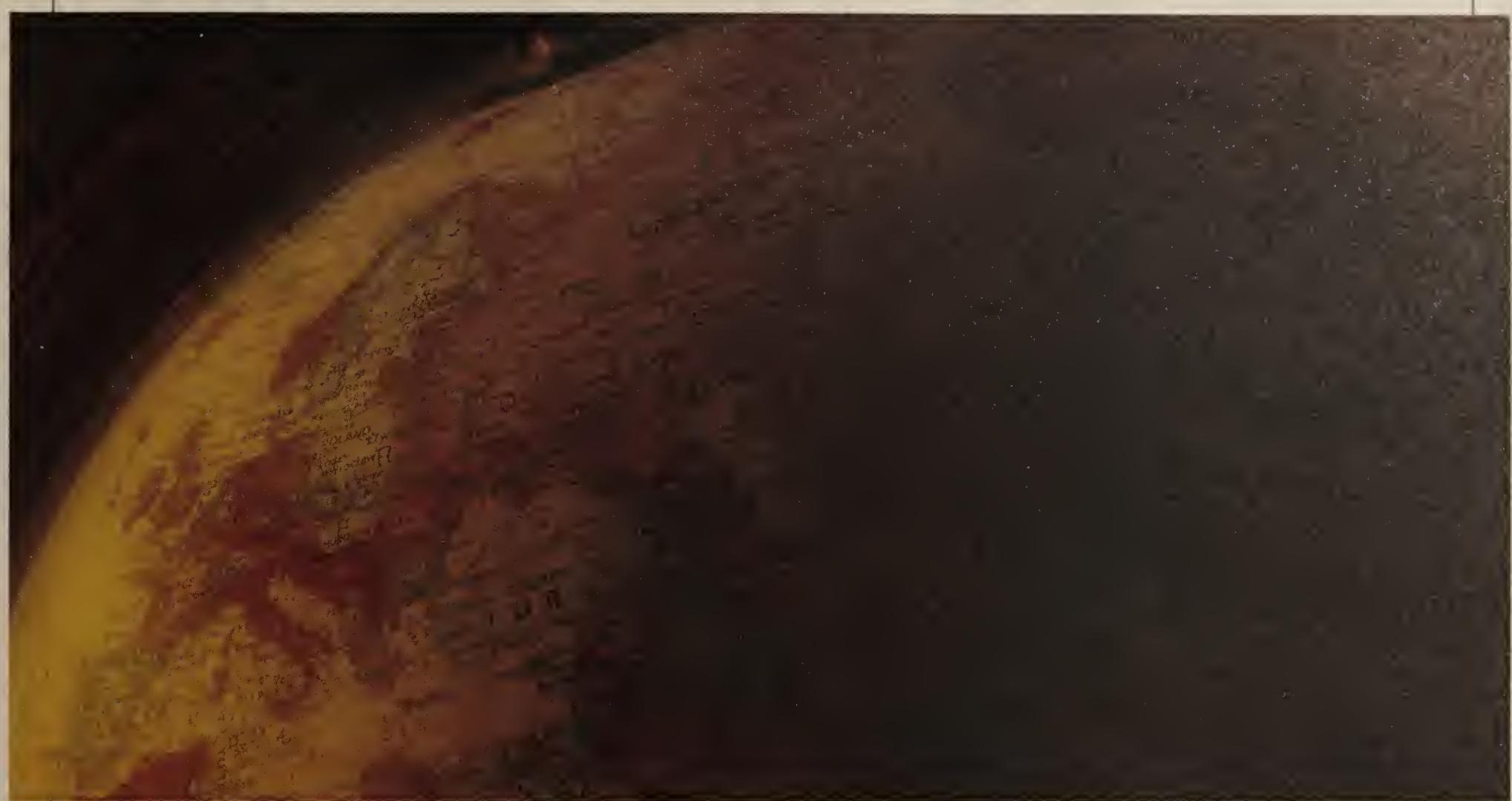
• Systems & applications software • Management software • Professional applications • Home entertainment software • Publications & journals

Organizers CHINA EXTERNAL TRADE DEVELOPMENT COUNCIL

TAIPEI COMPUTER ASSOCIATION

Sponsor TAIPEI WORLD TRADE CENTER

Venue: TAIPEI WORLD TRADE CENTER EXHIBITION HALL, 5 Hsinyi Road, Section 5, Taipei, Taiwan, Republic of China Tel 886-2-725-1314 Fax 886-2-725-1314 Telec 28094 TPEWTC Branch Offices: New York-CETDC, Inc. Tel (212) 532-7055 Fax (212) 213-4189 San Francisco-Far East Trade Service, Inc. Tel (415) 788-4304 Fax (415) 788-0468 Chicago-Far East Trade Service, Inc. Tel (312) 819-7373 Fax (312) 819-7377



IN TAKING OUR SOFTWARE TO THE NEXT STEP, WE FOUND OURSELVES GOING CONSIDERABLY FURTHER.

THE WORLDWIDE SOFTWARE SOLUTION FOR THE AS/400.

AS THE PREMIER PROVIDER OF AS/400 BUSINESS SOFTWARE TO MULTI-SITE, MULTI-NATIONAL COMPANIES ALL OVER NORTH AMERICA, WE LEARNED THE CHALLENGES THESE FIRMS FACE IN OPERATING ACROSS NATIONAL BOUNDARIES. IN BUILDING THEIR SOLUTIONS, WE CREATED THE SYSTEMS AND STRATEGIES TO HELP YOU GO BEYOND YOUR GEOGRAPHIC AND BUSINESS BORDERS AS WELL. WE OFFER INTERNATIONALLY-ENABLED FINANCIAL, HUMAN RESOURCES, DISTRIBUTION, ENVIRONMENTAL, AND PROCESS MANAGE-

MENT SOLUTIONS, FEATURING FULL NATIONAL LANGUAGE SUPPORT, MULTI-CURRENCY AND COMPREHENSIVE VAT PROCESSING. AND TO ENSURE YOUR SUCCESSFUL IMPLEMENTATION, WE'VE FORMED THE SOFTWARE 2000 GLOBAL SUPPORT SYSTEM, THUS CREATING A SEAMLESS SERVICES NETWORK WORLDWIDE. SO WHETHER YOU DO BUSINESS AROUND THE CORNER OR AROUND THE WORLD, CALL SOFTWARE 2000 AT (508) 778-2000. BECAUSE TOGETHER, THERE IS NO LIMIT TO HOW FAR WE CAN GO.

Software 2000

THE AS/400 BUSINESS SOLUTION.



Seven Of The Top 10 Fortune 500 Companies Rely On RELAY.[®]

Give us 30 days.
We'll show you why!

Why is RELAY[®] the corporate communication software product of choice? It's simple. It lets PCs and LANs communicate with mainframes over virtually any connection. It's easy enough for all levels of users. Flexible enough to accommodate diversity. And powerful enough for development of sophisticated, automated applications.

With RELAY[®]'s unique error-correcting protocol and convincing data compression, you get the fastest, most accurate data throughput available from anyone, to anywhere, and back again. In addition, RELAY[®]'s unique full duplex capability lets you send and receive files at the same time producing savings of up to 50% on your phone bill.

Add to that our always-free, reliable technical support, and it's no wonder why seven out of the top 10 Fortune 500-ranked companies are dedicated RELAY[®] users. And so are the leaders in Aerospace, Chemicals, Health & Beauty, Finance, Insurance, Telecommunications and more.

Skeptical? Give us 30 days, and we'll prove it.

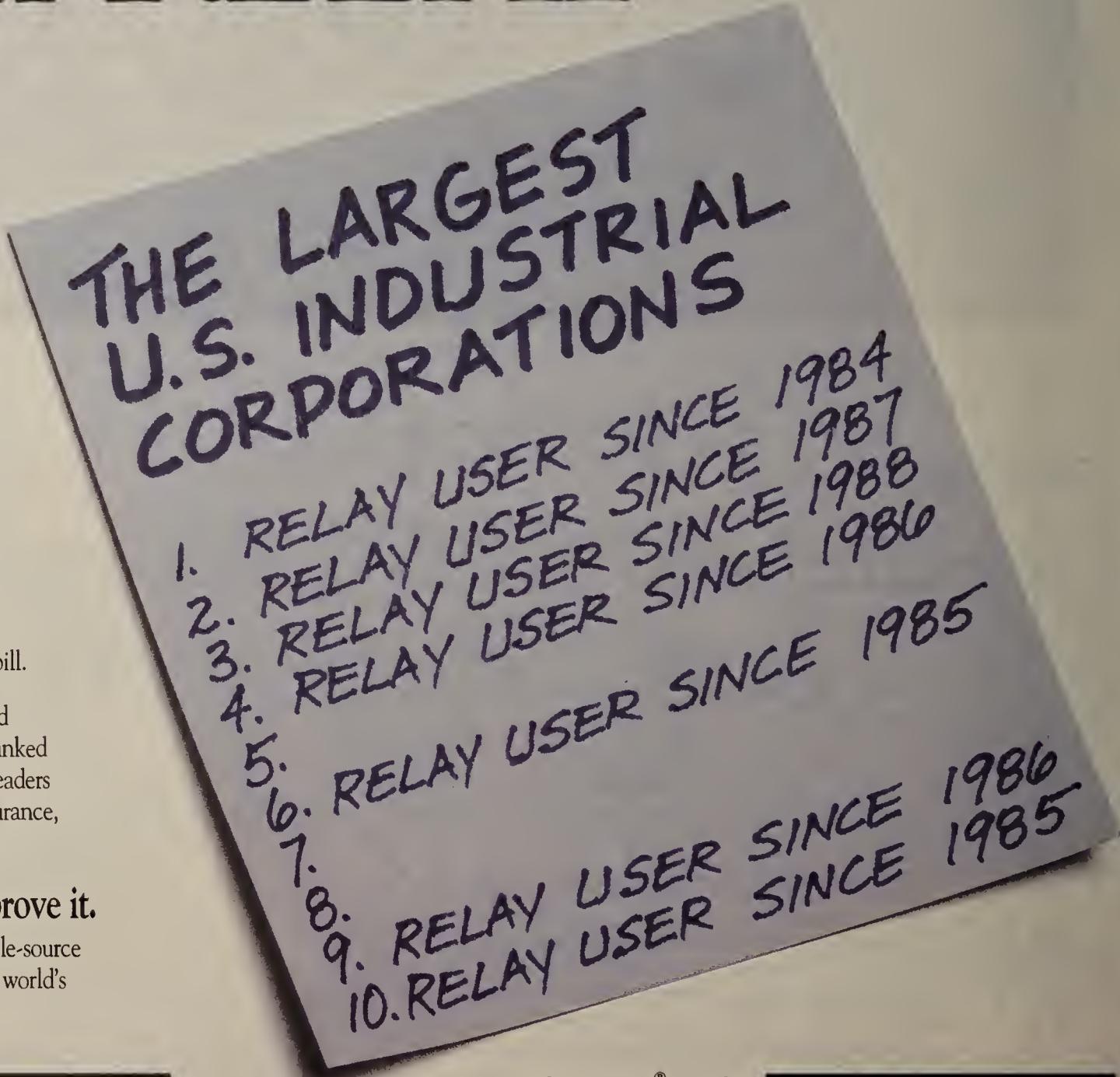
Our 30-day FREE TRIAL has turned into multi-year, single-source corporate communications relationships with some of the world's largest corporations. Find out why. Call us today.

For our free information packet
call toll-free 1-800-967-3529 (96-RELAY)



MICROCOM[®], INC.
STILL RIVER CORPORATE CENTER
55 FEDERAL ROAD
DANBURY, CT 06810-7325
U.S. and CANADA: 1-800-967-3529
INTL: 203-798-3800
FAX: 203-798-3937

Microcom and RELAY are registered trademarks of Microcom Systems, Inc. FORTUNE is a registered mark of Time, Inc. Magazine Company. Other trademarks are the property of their respective holders. © Microcom Systems, Inc., 1991. All rights reserved.



The RELAY[®] Family

- RELAY[®]/transfer for IBM mainframes.
- RELAY[®]/3270 for IBM mainframes.
- RELAY[®] Gateway for LANs.
- RELAY[®] Gold DOS and Windows for the PC.
- RELAY[®] SDLC Synchronous 3270 emulation for PCs.



NETWORKING

COMMENTARY

Elisabeth Horwitt

Too little, too late



A DEC user recently pronounced what may become the epitaph for DEC's dreams of becoming a dominant LAN client/server company: "They opened their network too little too late."

It must really gall DEC that its customers — not to mention certain analysts — still perceive it as dragging its heels in the open systems arena. After all, DEC has made such a point of bringing standards to its Network Application Support architecture and broadening its Pathworks client/server system to include a variety of non-DEC clients and servers.

The problem is that DEC is still seen, with some justification, as fixated on the VAX/VMS system. It may talk a good game about an open client/server architecture, but VMS remains DEC's mainstream system for making services globally available to corporate users.

The recent introduction of Teamlinks is a good example of this. The new product was designed to give Microsoft Windows users access to a variety of services provided by Pathworks servers, including E-mail, shared files, multivendor

Continued on page 60

Wireless networks create tough choices

ANALYSIS

BY ELLIS BOOKER
CW STAFF

With their passion for immediacy and portability, modern-day businesspeople probably would have invented wireless wide-area data networking if technologists had not provided it.

Last month saw a flurry of hardware and service plans for wireless systems from a mix of hardware, software and network providers. Not surprisingly, makers of laptop and palmtop computers have emerged as ear-

ly and eager advocates of the technology, which they see as tailor-made for their products.

However, the choices for users will not be easy. First, several competing and, so far, noninterconnected wireless networks are being deployed. Second, there are two-way interactive systems (said to be best for traveling workers who need to query a host database) and one-way, receive-only systems (touted as the better means for sending electronic mail and file updates).

At the same time, the broader issue will be how vendors face up to the challenge of what appears

Companies, relationships to watch

Motorola

- Has joint partnership with IBM in the interactive Ardis packet radio network.
- Last month launched Embarc (Electronic Mail Broadcast to A Roaming Computer), a service of Motorola's Paging and Teleport Systems Group, to bring one-way E-mail and other information services to mobile professionals.

Ram Mobile Data

- The unit of Ram Broadcasting Corp. that announced last month joint development and marketing agreements with Anterior Technology and Research In Motion. The three companies will develop a wireless E-mail service over Mobitex mobile data networks operated in the U.S. by Ram Mobile Data.

CW Chart: Michael Siggins

to many to be the first step in the inevitable confluence of the portable computer, the pager and, perhaps, the telephone.

The airwaves are not yet crowded with E-mail and database queries coming from executives at work in crosstown cabs. However, that could change dra-

matically as wireless networks aimed at data users expand.

As a consequence, estimates for the potential size of the market vary. BIS Strategic Decisions, a Norwell, Mass., market research firm, said that approximately 25,000 people now use

Continued on page 56

NET first to pledge support for DME

BY JOANIE M. WEXLER
CW STAFF

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc. (NET) recently stepped ahead of its traditional wide-area network competitors with a comprehensive network management plan and accompanying applications.

NET reorganized its network management products under the umbrella name "Netopen," a product family that the firm said will migrate to the Open Software Foundation's (OSF) Distributed Management Environment (DME).

In doing so, NET became the first T1 multiplexer vendor to

pledge support for DME, the industry hopeful for eventually becoming the industry-standard enterprise manager.

However, NET competitors, including Timeplex, Inc. and Radcal-Datacom, Inc., have paralleled if not preceded NET in supporting Simple Network Management Protocol, the de facto industry standard for managing local-area networking equipment.

DME is a hefty undertaking by OSF to integrate the network and systems management functions from such industry heavyweights as Hewlett-Packard Co. and IBM into a cohesive infrastructure for managing platform-independent distributed

computing environments.

Three new network management applications, which will provide DME hooks plus some NET-specific extensions, include a \$30,000-and-up Virtual Network Application (VNA) for partitioning enterprise networks into multiple, independent virtual networks.

A 'big issue'

The application allows multiple organizations hooked by private NET networks to better share and manage bandwidth, which is "a big issue for your average company," said James Herman, principal at Boston-based Northeast Consulting Resources, Inc. "VNA allows everyone on the

network to see the net in terms of the portion of it that is theirs," he said.

NET also expanded its expert system-based fault management system to be able to manage international networks and rolled out a \$9,950 version of its Series 5000 for managing small networks. This version is upgradable to the bigger system.

The new applications cannot currently be managed in an integrated fashion, acknowledged Karyn Mashima, the company's vice president of marketing.

NET's new product family is based on the OSF's Motif graphical user interface, HP's object-oriented OpenView platform and the X Window System protocol for accessing multiple hosts across a network in windows on one screen.

Monarch™ lets PC users get their hands on mainframe data. Without touching the database.

Now you can deliver mainframe data to PC users, any way they want it, any time they want it, without handholding, without custom programming, and without losing control of your database. Monarch makes it possible.

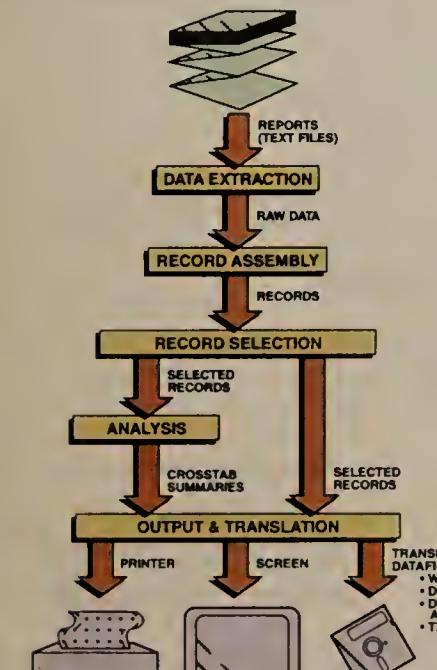
Monarch is a new kind of PC application that exploits standard mainframe reports as the source for data. Feed Monarch a spooled print file, and out comes data that users can query, sort, select, summarize, and send out to their favorite PC applications.

It's a simple idea. That's why it's so compelling. People already rely on reports for information, and MIS has already put time and effort into developing reports that make sense.

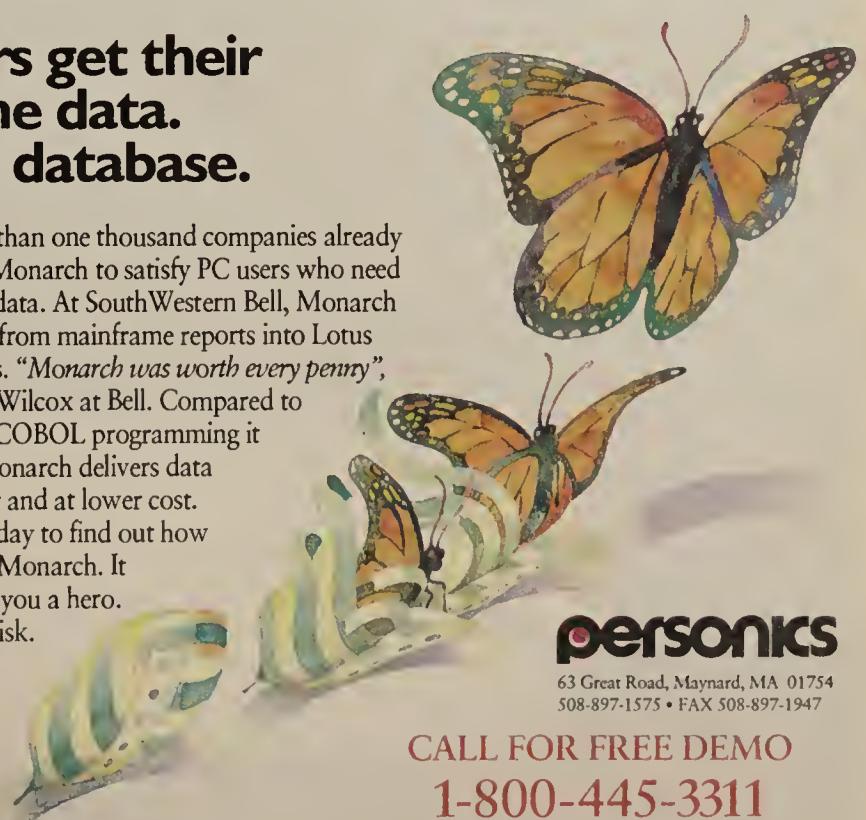
Monarch simply brings those reports alive. Not just plain-vanilla columnar reports, but also complex reports with multiple sort-levels.

More than one thousand companies already depend on Monarch to satisfy PC users who need mainframe data. At SouthWestern Bell, Monarch moves data from mainframe reports into Lotus spreadsheets. "Monarch was worth every penny," says Steven Wilcox at Bell. Compared to the custom COBOL programming it replaced, Monarch delivers data faster, easier and at lower cost.

Call today to find out how you can try Monarch. It could make you a hero. There's no risk.



Feed a spooled print file into Monarch and the data comes alive. Sophisticated parsing, recognition and query technology make it possible.



personics

63 Great Road, Maynard, MA 01754

508-897-1575 • FAX 508-897-1947

CALL FOR FREE DEMO
1-800-445-3311

Data exchange plan takes flight

BY GARY H. ANTHES
CW STAFF

The U.S. Department of Commerce recently announced a government/industry initiative to accelerate and coordinate the development of standards for electronic product/data exchange.

A plan for the initiative, presented at CALS (Computer-aided Acquisition and Logistic Support) Expo '91 in Phoenix by Robert M. White, commerce undersecretary for technology, is intended to speed the development of methods to express in digital format all useful information about a product. The technology is considered a cornerstone of computer-integrated manufacturing and concurrent engineering.

Deployment of the technology will allow geographically dispersed engineering, manufacturing and service firms to work together in defining, accessing and exchanging a product's physical and functional characteristics in an unambiguous way.

The plan was put together during the past six months by industry representatives from IBM, Digital Equipment Corp., Xerox Corp., The Boeing Co., McDonnell Douglas Corp., Mentor Graphics Corp., Westinghouse Electric Corp., General Motors Corp., the Initial Graphics Exchange Specification/Product Data Exchange Specification Organization and the industrial consortium PDES, Inc.

Government participation came from

NASA and the U.S. departments of Defense, Commerce and Energy.

The initiative will support the CALS Program, the Defense Department's effort to reduce the cost of designing, procuring and deploying weapon systems. According to one study, 10% of the cost of weapons systems goes for the paper-based technical data delivered with them. CALS is expected to spin off considerable benefits to nondefense engineering and manufacturing as well [CW, Nov. 19, 1990].

Integration intentions

The program, called the National Initiative for Product Data Exchange, is intended to integrate a number of existing efforts in the U.S. and abroad. "Truly hundreds of digital product data exchange projects are under way in industry and government," White said. "No consistent way exists to learn about overlapping or conflicting project areas. Critical gaps... all too often lie undiscovered."

The organization will lead the initiative, and a program office will be established at the National Institute of Standards and Technology. It will have a first-year budget of \$2.7 million, rising to \$4.1 million in the second and third years.

An initial goal of the program is to double the rate at which application-specific subsets of the product data exchange standards, called application protocols, are developed.

Choices in wireless networks

CONTINUED FROM PAGE 55

cellular telephones for data applications and that this number will grow to 250,000 or 300,000 by 1995.

AT&T Safari Systems, the maker of that company's wireless-enabled laptop, estimated that more than 4 million people will need wireless mobile data communications of all types by 1993.

Packet-switched radio frequency (RF) networks, notably those being built by Ardis, a joint venture of Motorola, Inc., IBM and Ram Mobile Data, Inc., are more cost-effective than cellular for short, "bursty" transactions of 1,000 to 2,000 characters. While not optimized for large files, the packet-switched approach is considered the preferred means for sending E-mail to and from mobile devices.

"There may be a killer application we haven't thought of yet, but I think E-mail access will be a mainstay," said Bill Frezza, director of strategic sales at Ericsson GE Mobile Data, Inc. in Paramus, N.J.

Last month, Ericsson GE Mobile outlined plans for its first portable radio modem designed to work the Mobitex mobile data network in the U.S. Ericsson GE Mobile has already delivered in-vehicle RF modems for the Mobitex network now being built in the U.S. by Ram Mobile Data.

Mobitex is an international standard for radio-based, packet-switched communications between portable and mobile computers and host. Mobitex, developed by Ericsson GE Mobile and the Swedish telecommunications authority, has operated networks in the U.S., the UK, Canada, Sweden, Finland and Norway.

Ram Mobile, which sent the first packets across its wireless U.S. network in February, has deployed its Mobitex network in some 15 U.S. markets.

But the Ram Mobile deployment lags behind Ardis, which was launched in early April 1990 with IBM's nationwide private radio data system and Motorola's own

commercial radio data network. The merger gave Ardis immediate coverage in 8,000 cities and all 50 states.

Unlike the "open standard" Mobitex system, Ardis uses a proprietary protocol and works only with RF modems from Motorola. Because Mobitex is a published standard, manufacturers other than Ericsson GE Mobile will be able to produce compatible radio modems and terminal gear.

In addition, Motorola announced a one-way RF system last month for sending E-mail and other data into laptop and palmtop computers. Dubbed Embarc for Electronic Mail Broadcast to A Roaming Computer, the service requires the use of Motorola's Newsstream receiver, a device about the size of a pager.

Attached to the user's laptop or palmtop, the Newsstream can receive and store 56 messages, or a total of 32K bytes of information.

Potential applications highlighted by Embarc officials include the following:

- Automatic updates of current prices, inventory information and order status to traveling salespeople.
- Specialized, vertical market databases, such as real estate listings.
- Information services tailored for each recipient.

Motorola said Embarc subscriptions will be available early next year for an initial \$395, plus a \$15 monthly fee and per-message fees.

Meanwhile, a paging and voice messaging company in Jackson, Miss., Mobile Telecommunications Technology Corp. (Mitel) petitioned the Federal Communications Commission for a wireless data networking "space," which it dubbed the Nationwide Wireless Network.

Through its Skytel Corp. subsidiary, Mitel is already a player in the wireless RF arena, with coverage in some 200 markets.

CDB Software
Announces the
APPLICATION ENABLING SERIES for DB2

AE SERIES

CDB REXX
full-blended interface between REXX and DB2. the simplicity and power of REXX with the superior data handling capabilities of DB2.

CDB EDIT
Basic-to-Basics DB2 Table Editing
power and intuitiveness

CDB EASTSQL
Software developer for DB2 programmers. step-by-step statement building and rich facilities for the DB2 novice. time savers for the experienced programmer.

AE I-O-U: Send or FAX for information on the new AE Series of DB2 Tools.

Name _____
Title _____
Company _____
Address _____

Telephone _____

Ada's Success in MIS: A Formula for Progress



Symposium
Tuesday - 14 January 1992

Sponsored by Director of Defense Information (OASD)

DISA Center for Standards
George Mason University
Center of Excellence In C3I

PANELS:

- MIS in Ada ... A Ten Year Track Record of Success
- Key Factors to Success in Using Ada
- Why Isn't the MIS Community Using Ada?
- Ada and Industrial Competitiveness

FEATURED SPEAKERS:

- Mr. Lloyd K. Mosemann, II,
Deputy Assistant Secretary, USAF
- Mr. Paul Strassmann,
Director of Defense Information

For further information contact:
GEORGE MASON UNIVERSITY
Center for Professional Development
Phone: (703) 993-2119

Workman extends into work-flow management

Network-based software package can route documents electronically and avoid paper shuffling

BY JIM NASH
CW STAFF

SUNNYVALE, Calif. — Reach Software Corp. recently introduced its second product, a work-flow management application called Workman, moving the company into a market receiving renewed attention.

Reach's first product was its Mailman electronic-mail software.

Work-flow management is one of the promising applications riding the backs of both local-area networking and E-mail. The software automates report and image filing.

Instead of filing paper expense reports with receipts, for example, employees fill out electronic forms and attach scanned images of receipts. New, network-based versions of the application send the documents to the proper person and can be pro-

grammed with options such as leapfrogging a person if the form sits too long on his desktop.

The software, once carried only on mainframes and minicomputers, is no longer confined to proprietary architectures. A spokesman for Reach, based here, said Workman was designed to run on Mailman, Novell, Inc.'s Netware Message Handling System (MHS) and Banyan Systems, Inc.'s Vines Mail systems. It is scheduled to ship next quarter.

Others on bandwagon

Two weeks ago, Digital Equipment Corp. introduced Teamroute, its own version of work-flow software. Teamroute, however, requires a server running DEC's MVS. A spokesman for DEC said subsequent versions of the application will not require MVS.

Beyond, Inc., maker of Be-

yond Mail, is also touting its work-flow software capabilities. Beyond Mail users can attach to routine business forms any image stored as a binary file and send it along over MHS-based mail services.

The interest may seem sudden, but it is not inexplicable. Scott McCready, an imaging analyst at International Data Corp. in Framingham, Mass., said sales of work-flow software amounted to \$100,000 last year, a hill of beans compared with the \$110 million he estimated it will generate in 1993.

Analyst Mary Rhodes, vice president of New Science Associates, Inc. in Southport, Conn., said packages such as Reach's bring with them much more complex document tracking abilities. Administrators can monitor the progress of documents as they circulate across networks. They can also let the software it-

self track the progress, deciding in some circumstances to either prod an employee or bypass him altogether.

"This is not a case of finding a technology before we have a need," said Art Beckman, manager of information technology services at San Francisco-based Pacific Gas & Electric Co. Beckman oversees a large Banyan network and was initially interested in Workman's close ties to Vines. He has since offered input on test versions of Workman.

Although he said he is unable to estimate how much an automated work-flow process would save PG&E, Beckman figured that it could cost as much as \$50 to shuffle one form from employee to employee.

Other vendors are taking note of work-flow software's growth. Benson Computer Research Corp. in McLean, Va., surveyed the existing market

and found it immature but developing. Jim Benson, president of Benson Computer, said he was looking for something into which he could build hooks for his imaging software, Imagefast.

Imaging software such as Imagefast, Benson explained, will ride on top of work-flow management software, which straddles E-mail packages, which in turn run on networks. In contrast to the products available, Benson said he found Workman to be the easiest to learn and use. He said his company is working with Reach to further develop the software.

Michael Joseph, network administrator at Imaging Technology, Inc. in Bedford, Mass., said reports routinely submitted on paper each Monday noting returned products have been automated. In fact, Joseph said, the company has customized report delivery so that the weekly documents sidestep the chief executive officer's in-box, where they might pile up. Instead, they are filed into electronic files designated for the reports.

Uncle Sam uses network and fax to fill jobs

ON SITE

BY GARY H. ANTHES
CW STAFF

MACON, Ga. — In the 1980s, seekers of U.S. government jobs waited months for their tests to be scored and applications processed, and federal managers extending job offers often discovered that the people they wanted to hire had long since given up on Uncle Sam and accepted positions in the private sector.

Now, aided by a national network of unattended minicomputer centers, the U.S. Office of Personnel Management (OPM) — formerly the U.S. Civil Service Commission and the personnel agency for the largest employer in the world — turns employment tests around in a day and entire applications in three days or less.

Automation of application processing eliminated the bottlenecks for the job-seeker, but it did not solve the key problem for the other person in the transaction: the government manager looking for the right person from the OPM's pool of 500,000 qualified applicants. The OPM now has a system to solve that problem as well.

Using the Automated Applicant Referral System (AARS), a manager anywhere in the U.S. looking for, say, a chemical engineer for a government laboratory near Chicago, can dial into a

Microlog Corp. voice-response system at the Staffing Service Center here. The system prompts the user for job-related information and the characteristics of the person sought. Aided by voice-synthesis software, the system repeats the information and asks the user to verify and, if necessary, correct it.

When the user hangs up, the request is passed to a Hewlett-Packard Co. minicomputer hub,

control system" that formats a database request, sends it to one of 16 unattended HP nodes on the wide-area network, tracks it and brings it back, taking various recovery actions if problems are encountered along the way.

Information about qualified candidates comes back to Macon over the network, an X.25 packet-switching network running on HP's NS network management software at speeds up to 56K bit/

control system" that formats a database request, sends it to one of 16 unattended HP nodes on the wide-area network, tracks it and brings it back, taking various recovery actions if problems are encountered along the way.

In a demonstration, Mayhew went through a complete telephone request in about a minute. "It's so simple that line managers can do it themselves; they don't have to get their personnel office to do it," he said.

The requester can elect to get either an unranked list of qualified people or one ranked by criteria such as test scores or veteran's status. AARS is implemented at present for entry-level engineers, physical scientists and mathematicians. Eventually, 85% of all job openings will be fillable through AARS, according to Mayhew.

AARS began operating in early 1990 and has referred more than 10,000 applicant lists to 900 users, he said.

AARS was conceived and implemented in just four months for a bargain-base price of \$50,000. "We were initially told to tie everything together with PCs," Peterson said. "When we delivered the cost figures, we were told to find an alternative to a full on-line system. We came up with the phone system and the fax."

The OPM and the U.S. Department of Defense recently set up an AARS clone called Defense Outplacement Referral System (DORS). DORS allows federal agencies and the private sector to use AARS concepts and some of the AARS infrastructure to place Defense Department people who have received pink slips into civilian jobs.

Frame relay repackaged

BY JOANIE M. WEXLER
CW STAFF

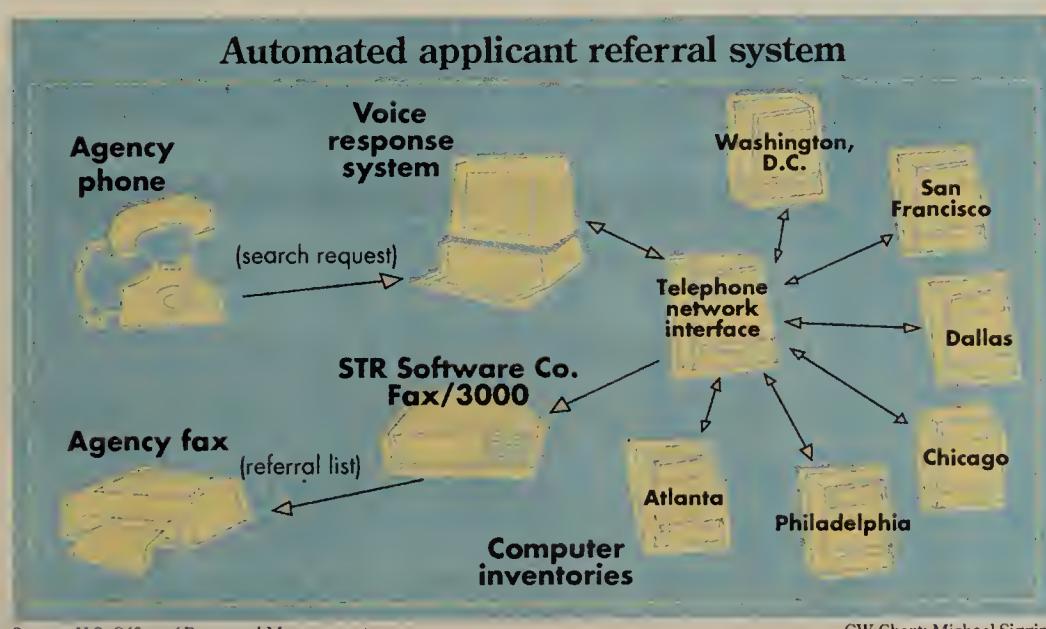
AT&T has bundled its frame-relay service, slated for general availability during second-quarter 1992, with two nontariffed, enhanced services in its Interspan product family.

The Interspan Information Access Service (IAS) and the Interspan Locator Service are aimed at cost-effective communications for mobile users. Subscribers to IAS, a data-only service, dial the same local telephone number from anywhere in the country to exchange low-speed data traffic for a flat per-minute service charge.

The voice/data Locator Service, available immediately, allows companies to publish one telephone number nationwide and connect callers to the company's local site based on their calling number.

Domino's Pizza, Inc. is reportedly testing the service; pizza eaters across the country dial one common number, and their call gets routed to the nearest Domino's restaurant. Pricing for Locator Service is on a per-port basis with some database charges.

The services are bundled with frame relay under the Interspan umbrella because they are enhanced networking options that use the intelligence of the network. Other AT&T services, such as the Accunet family, offer basic transport and are typically linked to customer equipment that carries the intelligence.



also in Macon. This central HP computer sees that the manager is seeking someone for the Chicago area, so it sends the request to the OPM's minicomputer center there. The Chicago database holds information about local applicants as well as those elsewhere who have said they would be willing to relocate to Chicago.

Don Peterson, chief of the Systems Support Division at the OPM's Macon center, called the homegrown software on the HP hub "an intelligent transaction

sec. It is passed through an interface system that converts the results of the search into fax format, looks up the requester's authorized fax telephone number and sends the list of candidates back to the requester. The whole process generally takes between 15 minutes and 45 minutes and involves no human activity other than the user's.

According to Kenneth P. Mayhew, director of the Staffing Service Center, it used to take one to two weeks to get an appli-

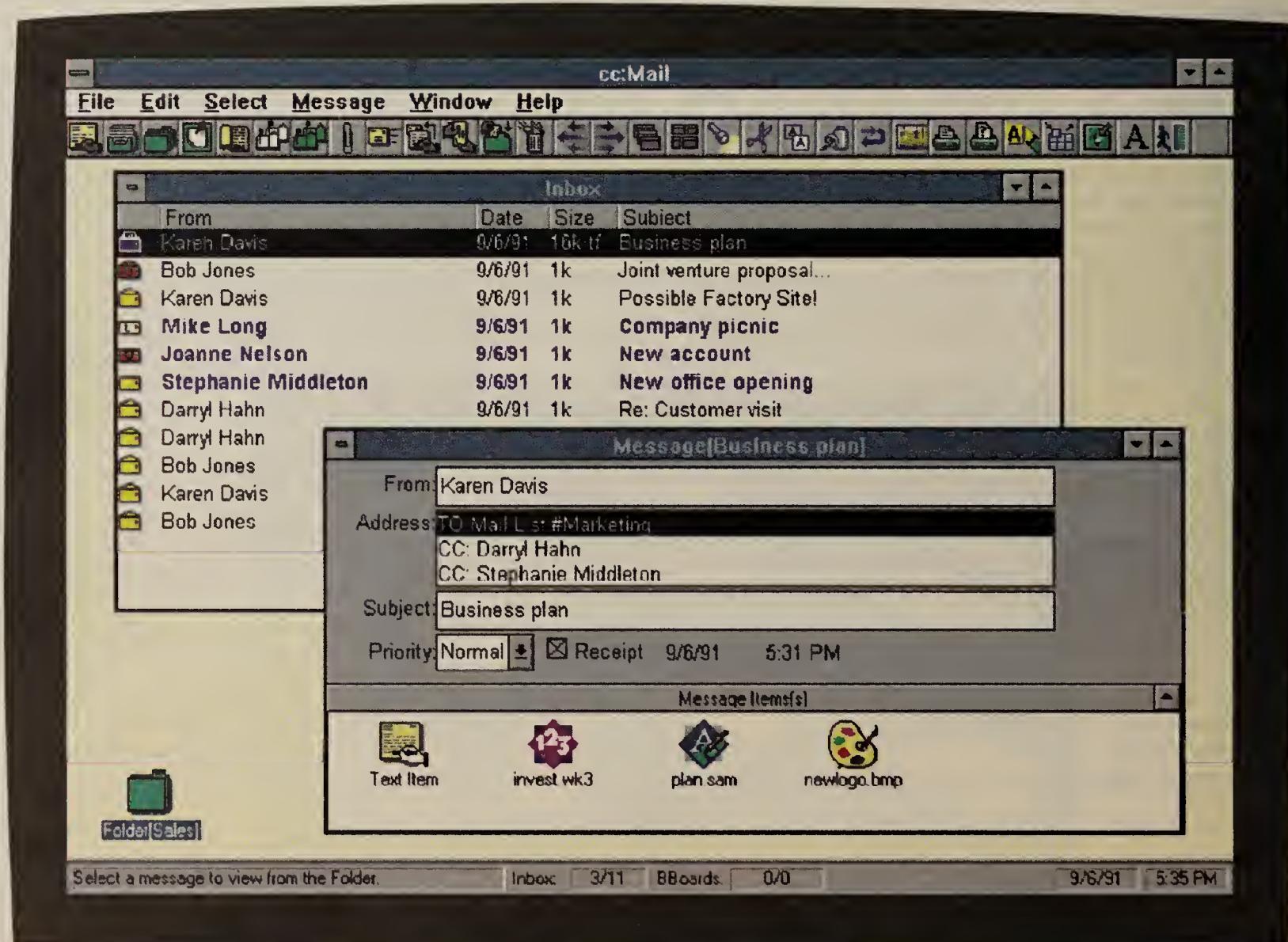
Why is cc:Mail the leader?



cc:Mail is so easy to install, learn and use, you can have your electronic mail system up and running quickly.



cc:Mail can send information across all of these computing platforms to reach everyone in your organization.

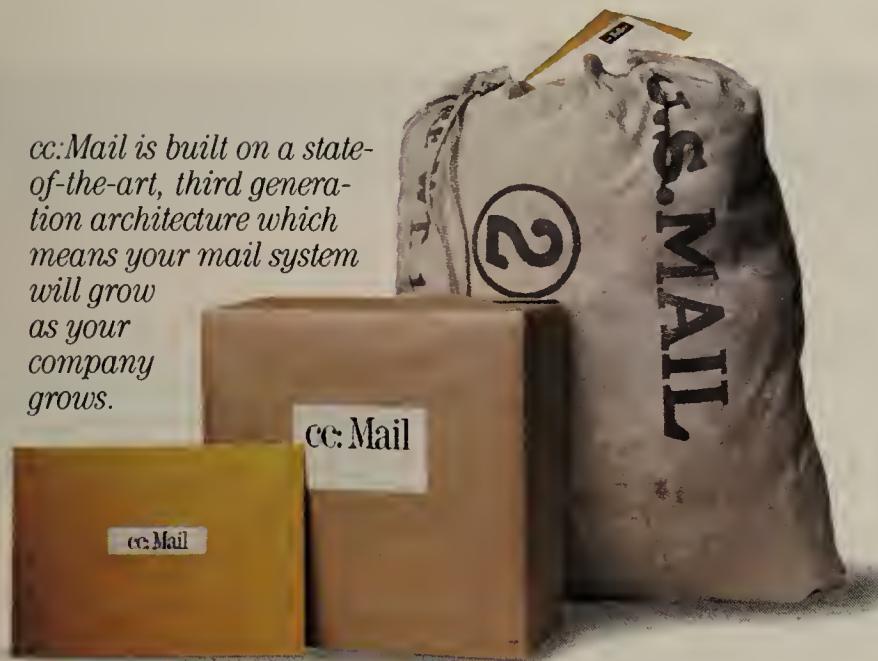


Over a million satisfied customers have already given cc:Mail a first-class rating. For example, Windows users love its easy-to-use interface, SmartIcons™ and application integration. And PC World says "Sending a cc:Mail message is easier than addressing an envelope and licking a stamp." 9/91*

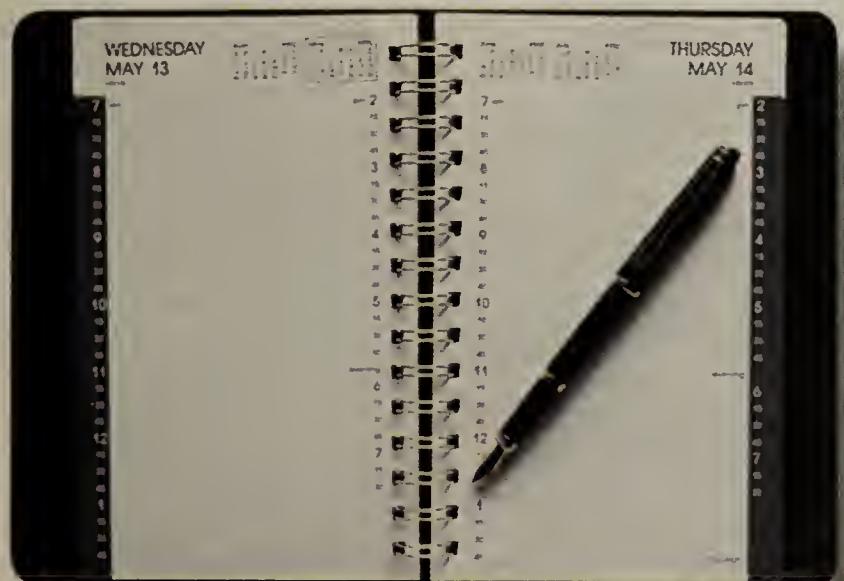
© Copyright 1991 cc Mail, Inc., a wholly-owned subsidiary of Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks and SmartIcons is a trademark of Lotus Development Corporation. cc Mail is a trademark of Novell, Inc. Banyan is a registered trademark of Banyan Systems, Inc. Ami Pro is a trademark of Samna Corporation.

ding e-mail package?

cc:Mail is built on a state-of-the-art, third generation architecture which means your mail system will grow as your company grows.



You can send a file from any mail-enabled application, such as 1-2-3® for Windows and other industry leading software programs without leaving the application.



Keep things running on time with cc:Mail's advanced integrated calendaring and scheduling option.

It's easy to see why cc:Mail™ from Lotus® is the world's leading electronic mail package. Because it delivers more than messages. It handles just about any electronic mail need you might have. No matter how large or small your workgroup is. With it you can send text, files, graphics and faxes across all major local area networks such as Novell® LAN Manager and Banyan.® Without needing new hardware.



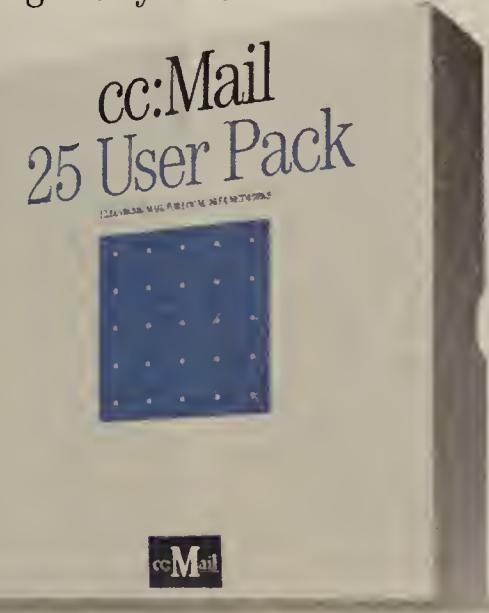
Better still, it allows you to send electronic mail effortlessly back and forth from different platforms—such as DOS, Windows™ 3.0, OS/2® and Macintosh®—across the same LAN. Plus, with cc:Mail you can access public mail and even mainframe mail quickly and easily.

Our newly released cc:Mail for Windows takes full advantage of Windows 3.0. Support of Dynamic Data Exchange lets you easily send other mail-enabled Windows files from within those applications. For example, you can send a report you've written with Ami Pro™ for Windows across the country while the application is still on your desk top.

Plus, cc:Mail is the first package of its kind to take advantage of a new, fully scalable messaging architecture. This means cc:Mail will grow along with your business.

Whether you're adding six new users, 6,000 or 60,000, cc:Mail is a proven solution. As *PC World* has said, "It's clearly a best buy." *PC World*, 9/91*

For a free demo disk of the cc:Mail Macintosh, Windows or DOS Platform Pack of your choice, call us today at 1-800-448-2500.



cc:Mail from Lotus

Trademark of cc:Mail, Inc. Windows is a trademark of Microsoft Corporation. OS/2 is a registered trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Novell is a registered trademark of a wholly-owned subsidiary of Lotus Development Corporation. *This quote reprinted with the permission of PC World.

Horwitt

CONTINUED FROM PAGE 55

database access and compound document exchange.

Servers accessible via Pathworks include OS/2, DEC's Ultrix and, naturally, VMS. However, non-DEC servers can only provide services to a LAN; LAN users who want to share files or access databases on a remote LAN must use a VMS server. And, as that same network manager put it, "I don't want to install a Microvax on every LAN." What the manager would like to do is install Decstations running Ultrix, whose prices are rapidly dropping. Alternately, he wouldn't mind putting in a few Sun Sparcstation servers. The point is, he wants to choose for himself.

DEC group manager John Rose says that DEC will "ultimately" (no time frame) move global services to OS/2 and Ultrix. And the vendor will also move its All-In-1 office system to the Open Software Foundation's OSF/1 Unix platform, Rose adds.

DEC also plans to provide "tighter integration" between its client/server system and that of Novell, according to Rose. A step in that direction will be to let Novell Netware clients use native Novell IPX calls to get at Pathworks servers. Right now, users need to implement dual Decnet and IPX stacks to access Novell and DEC servers. Interoperability be-

tween Netware and All-In-1 services "is not too far away," Rose says.

Rose says DEC is unaware that it had better start delivering a more democratic client/server architecture if it wants to make any kind of dent in the client/server market. Many firms, whose LAN installations began as a grass-roots effort, are now integrating those networks from the bottom up. That generally means using Novell or Banyan servers to set up corporatewide E-mail and file sharing.

The only reason for these companies to use a VAX host as the E-mail/file server would be if they have such a system, with spare CPU power, tucked away in IS somewhere. To expect a non-DEC shop to buy a Microvax for each of its LANs is laughable. Even our friend the network

manager, whose company already uses DEC and Pathworks, balked at the idea.

Of course, if DEC ports its whole Teamlinks/Pathworks/NAS architecture to Unix, it runs the risk of having its own users start migrating to Sun Sparcstations. A thorny dilemma.

Another problem for DEC is how to convince users that it can provide the kind of third-party support they need for their LAN client/server installations. Another user tells us that third-party support is the biggest problem Pathworks has. "VARs flash their Novell certification — then say they don't know what Pathworks is," the user says.

DEC is working on this, too, Rose says. The company has been signing up LAN VARs, along with regional distribu-

tors with VAR-like support, he adds. These companies are being "synergized with DEC's direct sales force," so that the two groups can work together to meet customers' needs, Rose says.

It would seem that DEC has a good idea of where its weaknesses are and will ultimately address them. The big question is whether DEC — given its inevitable ambiguity about the strategy — will get it in place fast enough to become a viable contestant in the client/server sweepstakes. Now is when a lot of companies are figuring out their long-term LAN strategies; DEC can't afford to sit on the fence much longer.

Horwitt is a *Computerworld* senior editor, networking.

NETWORK SHORTS

Drug firm backs X12

McKesson Drug Co., a subsidiary of San Francisco-based McKesson Corp., is stepping away from Econolink, its proprietary remote-access software that the firm's customers use to order goods. Last month, McKesson said it would begin supporting the ANSI X12 standard on Econolink. Personal computer systems supporting X12 get the same 30-minute turnaround for order confirmation.

Electronic data interchange (EDI) will replace paper billing for **Crown Central Petroleum Corp.**, based in Baltimore. **Bell Atlantic Corp.** has begun installing EDI services for Crown, which expects to cut the cost of billing from 75 cents per invoice to 16 cents per invoice. Crown processes 50,000 invoices monthly. The installation is expected to be 70% completed by the third quarter of next year.

L.M. Ericsson Telefonaktiebolaget has announced the ability to pass alerts from its NM400 network management system up to IBM's Netview network management console. The Stockholm-based X.25-standard networking firm said it would aid in centralizing network management by incorporating Netview access and allowing some corrective commands to be issued from that console.

Eleven reasons why more organizations respond to change with

COMPUTERWORLD BENCHMARKS UNISYS CASE/4GLs CONDUCTED BY COMPUTING FUTURES LTD.

- Complex Transactions*
- Complex Reports*
- Interface*
- Enhancement*
- Level of Completion*
- Analysis and Design*
- File Maintenance Transactions*
- Speed of Development*
- Speed of Maintenance*
- Documentation*
- Tool Integration*

Evaluation of LINC Design Assistant, LINC, MAPPER and its database DMS II.

NEW PRODUCTS

Local-area networking hardware

Netframe Systems, Inc. has announced a disk subsystem for local-area networks.

Netframe Live-Drive allows users to remove and add disk drives without interrupting LAN operation. It is based on small computer systems interface technology.

A subsystem with 1.6G-byte capacity is priced at \$7,995. Smaller models will also be offered.

The company has also announced LAN software that supports multiple redundant connections between a server and

standard Ethernet and Token Ring networks.

Netframe Multinet extends fault tolerance to the server LAN/connection, the company said. It is initially offered for the OS/2 operating environment. Pricing for the software on entry-level Netframe servers is \$3,995.

Netframe Systems
1545 Barber Lane
Milpitas, Calif. 95035
(408) 944-0600

BICC Communications has announced new line cards for its Isolan Etherconnect System.

The cards include an improved Simple

Network Management Protocol product (\$1,995) and a 57.6K bit/sec. Terminal Server Card (\$3,995) supporting Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Local Area Transport. New six-port Fiber Optic Repeater Cards for increased fault tolerance (\$2,495) are also offered.

BICC Communications
103 Millbury St.
Auburn, Mass. 01501
(508) 832-8650

Cabletron Systems, Inc. has introduced two high-density Token Ring modules for its Multi Media Access Center (MMAC) wiring hub series.

The modules feature 24 ports, doubling the total user capacity of each

MMAC hub. The high-end MMAC-8FNB, for example, can now support up to 168 users.

The new products also include active port circuitry for improved signal reliability over extended cable distance.

Both modules are priced at \$3,795.

Cabletron Systems
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400

Network management

Qualix Group, Inc. has announced Netscope, a network management product for Sun Microsystems, Inc. workstations.

Netscope runs under the Open Look software interface and provides detailed network traffic information. It includes three tool sets: Load Monitoring Tools, Packet Analysis Tools and Connectivity and Load Generation Tools.

Netscope costs \$2,995 per copy.

Qualix Group
Suite 224
1900 S. Norfolk St.
San Mateo, Calif. 94403
(415) 572-0200

Codenoll Technology Corp. has announced Codenet Ringview, a network management software package for Fiber Distributed Data Interface (FDDI) networks.

Codenet Ringview displays statistics on network performance and communicates with any device on a multivendor FDDI network.

The product runs under DOS on a personal computer connected directly to the network (via a Codenet FDDI adapter card) or connected to an FDDI concentrator. It offers five management functions.

The software monitors up to 500 network nodes and is priced at \$12,995. A single-attached station adapter costs \$4,995.

Codenoll Technology
1086 N. Broadway
Yonkers, N.Y. 10701
(914) 965-6300

Micro-to-host

Computer Methods Corp. has announced a new version of its VMS-based asynchronous Appletalk software package.

The product, Asyncserver, allows users of Apple Computer, Inc.'s Remote Access Macintosh software to access Appletalk network services on host VMS systems via dial-up lines. New security features are also added in Version 2.

Pricing ranges from \$700 to \$12,000, based on the number of concurrent users.

Computer Methods
Suite 300
525 Route 73 S.
Marlton, N.J. 08053
(609) 596-4360

COMPUTERWORLD



with your computer/modem

UNISYS
We make it happen

Unisys CASE/4GLs.

Excellent

Excellent

Excellent

Excellent

Excellent

Very Good

Everything you need to know about the difference between a Compaq PC with Intelligent Modularity and a merely upgradable PC.

These days, a lot of personal computers have upgradable processors and memory. But the new COMPAQ DESKPRO/M PCs have Intelligent Modularity, which goes far beyond ordinary upgradability. This unique design makes these PCs a smart investment for today and tomorrow.

Smart for today—

designed for today's needs and today's budgets. Intelligent Modularity puts all vital subsystems on separate boards so you can choose just the performance and features you need.

Since the parts are interchangeable, the whole office can



Suggested Resale Price starts at just over \$3,000 for this family of four remarkable PCs.

Nobody else gives you all the advantages you get with the COMPAQ DESKPRO/M PCs.

| | COMPAQ DESKPRO/M FAMILY | ALR BUSINESS VEISA | AST PREMIUM II | DELL POWERLINE DE | IBM PS/2 MODEL 90 |
|---|-------------------------|--------------------|----------------|-------------------|-------------------|
| 1. Five-board modular design | Yes | No | No | No | No |
| 2. Upgradable video without using an expansion slot | Yes | Yes | No | No | No |
| 3. Separate I/O board for potential enhancements and ease of service | Yes | No | No | No | No |
| 4. 14 levels of security including cable-lock provision | Yes | No | No | No | No |
| 5. System configuration and ID number available in memory and accessible remotely | Yes | No | No | No | Yes |
| 6. Power supply adequate for all expansion needs | 240w | 150w | 145w | 220w | 194w |

standardize on one platform. And since the parts are easy to access, they're easy and inexpensive to service. Replacement parts cost less, too.

Keeping track of what's inside each PC is easy with our built-in Asset Management provision. Each COMPAQ DESKPRO/M PC

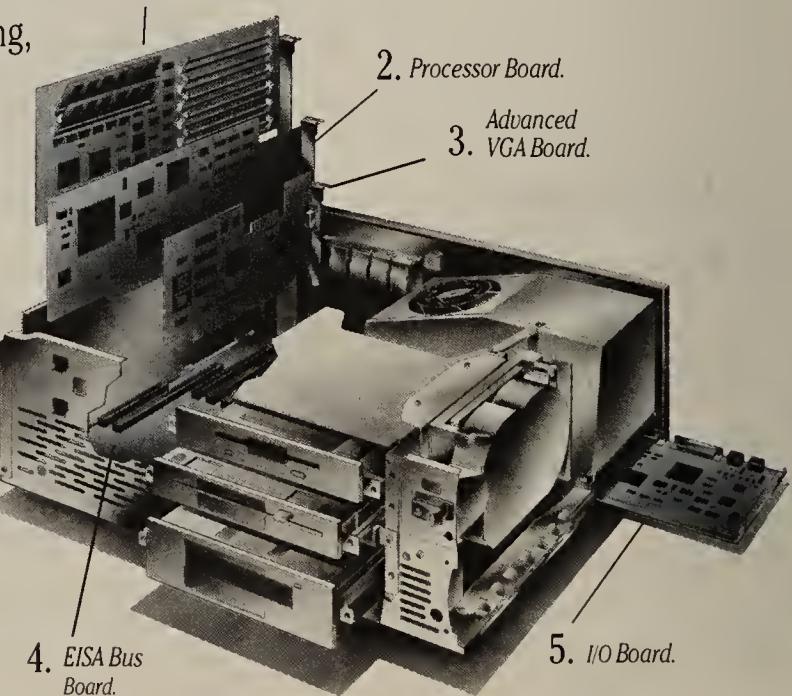
can tell you its serial number, how it's configured and what it has installed. Even remotely, over the network. A big time- and money-saver for MIS managers.

Smart for tomorrow—built to adapt to changing technology and changing needs. With Intelligent Modularity, upgrading and expanding only takes about five minutes. And, thanks

to unique

Compaq engineering, you get optimum performance no matter how you configure your system.

The 32-bit EISA expansion bus gets the most out of high-performance processors, expansion boards and peripherals. Superior



Intelligent Modularity—Five separate subsystems let you upgrade or replace only what you need.

thermals keep things cool, no matter how many options you add. And the 240-watt power supply can take anything you plug in.

Call your Authorized COMPAQ Computer Dealer and ask to see the wonders of the COMPAQ DESKPRO/M personal computers firsthand. Call 1-800-231-0900, Operator 185. In Canada, call 1-800-263-5868, Operator 185.

Everything the boss needs to know.



1. It's smart.
2. It's easy.
3. It's affordable.

COMPAQ

It simply works better.



At Motorola Codex, we go the extra mile for you. And your budget.

First, by designing products that perform, plain and simple. Our newest high-speed V.32 dial modems help cut operating costs by shortening connect times and improving response times.

With our flexible 6500 Series packet switches, you can reduce line charges by running multiple data protocols over a single link.

**"IT'S NOT
BREAKTHROUGH
IF IT DOESN'T
CUT MY COSTS."**

comes standard with our multi-rate, multi-service-type 3500 Series DSU.

And our remote 6310 EtherSpan™ LAN bridge--the only multiplexing bridge in the industry--lowers both hardware and line costs by connecting up to 24 separate LANs over a single physical channel.

These are just a few cost-saving examples from our multitechnology portfolio of products that have been carefully architected to work together to solve real business problems. And to work with other vendors' equipment and carrier services.

You get all this plus reduced product life cycle costs, a result of Baldrige Award winning quality, and sales and service people within easy reach on six continents.

To learn more about how we're helping businesses worldwide make one of their single biggest corporate investments--their communications network--pay off, call us at 1-800-426-1212, ext. 7216.

We might come up with a breakthrough for you too.

MOTOROLA
CODEX

MANAGER'S JOURNAL

THE
CEO VIEW

IS helps Helene Curtis look its best

*CEO Ronald J. Gidwitz sees importance of information technology
but knows it is only one part of a successful business strategy*

BY ELLIS BOOKER
CW STAFF

While it would be stretching the point to say he rose to his current post from a lowly programming job, Helene Curtis Industries, Inc. Chief Executive Officer Ronald J. Gidwitz does remember the summer after college when he wrote Fortran code for the manager of data processing operations at the company he now runs.

Programming "was a discipline that I had a facility for. I found it to be logical and challenging, and it was therefore something I liked," Gidwitz candidly adds, however, that at the time, he never anticipated information technologies would have the kind of impact that they ultimately did.

At the same time, Gidwitz is realistic about the benefits of information systems and continually stresses that this function must be seen as only one piece of a larger business plan.

With hair-care brands such as Saloon Selectives, Finesse and Sauve, Helene Curtis is No. 2 behind Procter & Gamble Co. Helene Curtis had revenue of \$867 million in fiscal 1990 and expects to top \$1 billion in 1992.

■ On when data processing resisted distributed technology:

"This was when Apple Computer, Inc. was very young and was distributing its product in hobby shops. Well, I came into a hobby shop, and there was one of the first Apple computers.

"I went to the CFO and said, 'We should have one of these.' The following Christmas, I was out wandering around and there was the same device, and I thought, 'Where is our Apple computer?' In one year, the guy had not bothered to get it. At which point, I went back to the CFO and suggested in strong language that it would be appropriate to get one.

"When the data processing department got the machine, it just sat there. There was real concern in data processing about decentralizing and losing the integrity of our information. So we hired a student and put [the computer] in the marketing department. We've been dispersing those kinds of devices throughout the corporation ever since."

■ On workstations:

"Virtually everyone has or will have some form of workstation. But more importantly, they'll have systems to support their needs. The easy part is to put the box on a desk; the tough part is to put systems in place to give people information in a fashion

so they can do their jobs better."

■ On strategic thinking:

"We seem to be able to tactically compete — we're probably more responsive than either the Japanese or the Europeans. But information systems is only a part of the issue. How do you restructure and recraft jobs; how do you organize workers? These are not issues most American companies give a whole lot of thought to."

■ On bringing suppliers, manufacturers and customers closer:

"We are very good at that. We are a high-service supplier, and the only way we can achieve that kind of high service is to have the capacity to know what needs to be done. The only way you do that is to have timely and effective information systems.

"We were and are a fast-growing company, and that in itself created pressure on our level of service. Four or five years ago, we were being told by a number of our customers that our service level wasn't what they wanted. We're in the marketing business, and we try to get a good understanding of how our customers feel about various things that we offer them.

"For example, how you handle your inventory got to be a very important issue for us. We addressed all of those issues. And a critical part of it is knowing what the heck is going on."

■ On a type of strategic system:

"Ultimately, the thing that may be most important is how you use expert systems. Take the difficulty of satisfying inventory demand.

"One of the interesting things in

INSIDE

- S. C. Johnson & Son, Inc. makes entrepreneurs out of two former employees. Page 68.
- Michael B. Emery as diplomat. Page 70.



Michael Abramson

The CEO: Ronald J. Gidwitz, a graduate of Brown University with a bachelor's degree in economics.

The career: Joined Helene Curtis in 1968 from Chicago-based financial services firm Walter E. Heller & Co. Has served as Helene Curtis' president since 1979; assumed the role of CEO in July 1985. Active in the Republican Party and was formerly a ward committeeman.

Accomplishments: Since taking over the company in 1979, annual revenue has increased sixfold. In 1990, Helene Curtis was vendor of the year for Kmart Corp. and has been Walmart Stores, Inc.'s vendor of the quarter repeatedly over the past two years. Ranked No. 1 on the Computerworld Premier 100 list of consumer products and services companies in 1991.

our business, with fewer and fewer retailers, is that when our products are featured in promotions, it tends to spike our business. How do you handle that? The easy way would be to load up the warehouses. Unfortunately, that's pretty expensive. So the issue becomes, what type of systems can better manage your inventory, advertising and marketing expenses?

"Obviously, you can't do that without information. Information is the single most critical tool you have for managing your business. And to the extent that you don't have information, you then have to make judgments which are, by definition, inaccurate. As you get information that more precisely tells you what's happening, you move away from subjective judgments to objective — well, less subjective — judgments."

■ On justifying IS:

"We spend roughly 2% of the annual budget on IS. In the late '70s, we might have been spending 1%. Plus, the corporation has been growing 20% to 25% a year, so you're talking about significant invest-

ments. At the same time, we'd like to be spending more.

"The dollars being spent for IS have to compete with dollars being spent on marketing, research and manufacturing. [Making the budget] is a collegial process. Information systems are broad in their utilization, and they're systemic: You have to deal with all the people and all the functions in the system.

"One of the toughest areas to deal with from a budgetary standpoint is IS because it is cross-functional. Every adjustment up or down has a ripple effect throughout the organization.

"It's easy to cut things. Take advertising. We spent \$130 million in advertising last year. If I needed to save \$10 million, I could just call the advertising department and say, 'Cut \$10 million.' That's easy. Is that smart? Hell, no! What you want to do is understand what are the priorities of our business long-term. If you don't bring in the next generation of computer or don't hire the next 10 people you need to develop a program, you may not see [the effect] for one or even two years. But three years from now, you'll be in big trouble."

Mirror your data, without mirroring your costs.



IPL breaks the barrier to more affordable mirroring. Introducing the 7936 Disk Array—the latest DASD advancement that provides exceptional performance, capacity and affordability. The 7936 offers the largest capacity of any disk device on the market—5.3 GB—at the same cost as 3.4 GB units. That's 55% more storage capacity utilizing 20% less space.

As a result, you can mirror your AS/400 data, or double your storage capacity, without doubling your equipment costs. In fact, IPL's special introductory offer reduces storage costs to under \$10/MB, which gives IPL's 7936 the best



IPL introduces the standard for

Mirror your AS/400 data with affordable costs.

IPL 7936 Model 30*

- 55% Greater Capacity**
- 51% Lower List Price/MB**
- 20% Less Maintenance Cost**
- 20% Less Rack Space**

price/performance of any AS/400 DASD product on the market today. And like all IPL products, it's backed by our 18 years of reliability, performance and leadership in the IBM-compatible market. For more information on IPL's 7936 Models 10, 20 and 30, call IPL today at 1 800 338-8475, 617 890-6620 in

Massachusetts. In Europe call our Belgium office at 011-32-2725.41.58. And start mirroring your AS/400 data, without mirroring your costs.



affordable AS/400 mirroring.

*Compared to IBM Model 20.

IBM and AS/400 are registered trademarks of International Business Machines Corporation.

S.C. Johnson execs bring their baby to market

BY KIM S. NASH
CW STAFF

It's the information systems manager's dream: His staff builds a computer system for internal use but later sees the project take off wildly, win awards and make it in the general market.

Add the plot twist of a shake-up in the executive IS ranks that throws the program temporarily by the wayside, and you have the story behind Proficere, an IS skills tracking system originally built by and for S.C. Johnson & Son, Inc.

In early 1989, S.C. Johnson, the household products maker that produces

Raid bug spray and Pledge furniture polish, hired programmer/consultants Dean LaGrange and Al Bejcek to help build an automated system for tracking the technical, personal and business skills of its 400-member IS staff. By the end of that year, the pair had rolled out Proficere, an IBM MVS-based system that contained 100 different job models.

Proficere seemed to be a success at S.C. Johnson, based in Racine, Wis., shaving 20% from the company's annual professional development investment for 1990. The program won an Assist Award for quality in training programs that year from the Association for Computer Train-

ing and Support. S.C. Johnson even sold it to other big user companies, such as Burlington Northern, Inc., Allstate Insurance Co. and Xerox Corp.

Then came the shake-ups. In March, Johnson's chief information officer and noted industry figure, Laurance Burden, suddenly left the company. Randy Leneyel, director of IS management support services and the man who spearheaded Proficere's development, also resigned. Corporate enthusiasm for Proficere apparently petered out.

Undaunted and knowing they had a potential commercial product on their hands, LaGrange and Bejcek soon after

bought the rights to Proficere from S.C. Johnson in June, left the company and started selling the system — renamed Premier — on their own.

"We're in the gear-up stage just now, but things look good," said LaGrange, president of newly formed Premier Professional Development, Inc. in Lake Bluff, Ill. Bejcek is vice president.

Since then, Burlington Northern has followed Premier from S.C. Johnson to LaGrange's shop and remains a steady customer. The railroad holding company recently installed the upgraded version of the software, LaGrange said.

Meanwhile, LaGrange is negotiating with Johnson's old customers, and Motorola, Inc. has plans to run a several-month pilot, starting early next year, he said.

They have ported Premier to DOS, OS/2 and Unix, "so that just about anyone can use it," and are currently talking with potential distribution partners. They would not identify what companies those are, but they are open to alliances with training and human resources companies, among others, according to Bejcek.

The fact that LaGrange and Bejcek took Premier from an IS group has helped them, they said, because they know firsthand how IS departments operate. "There's a certain kinship," Bejcek said.

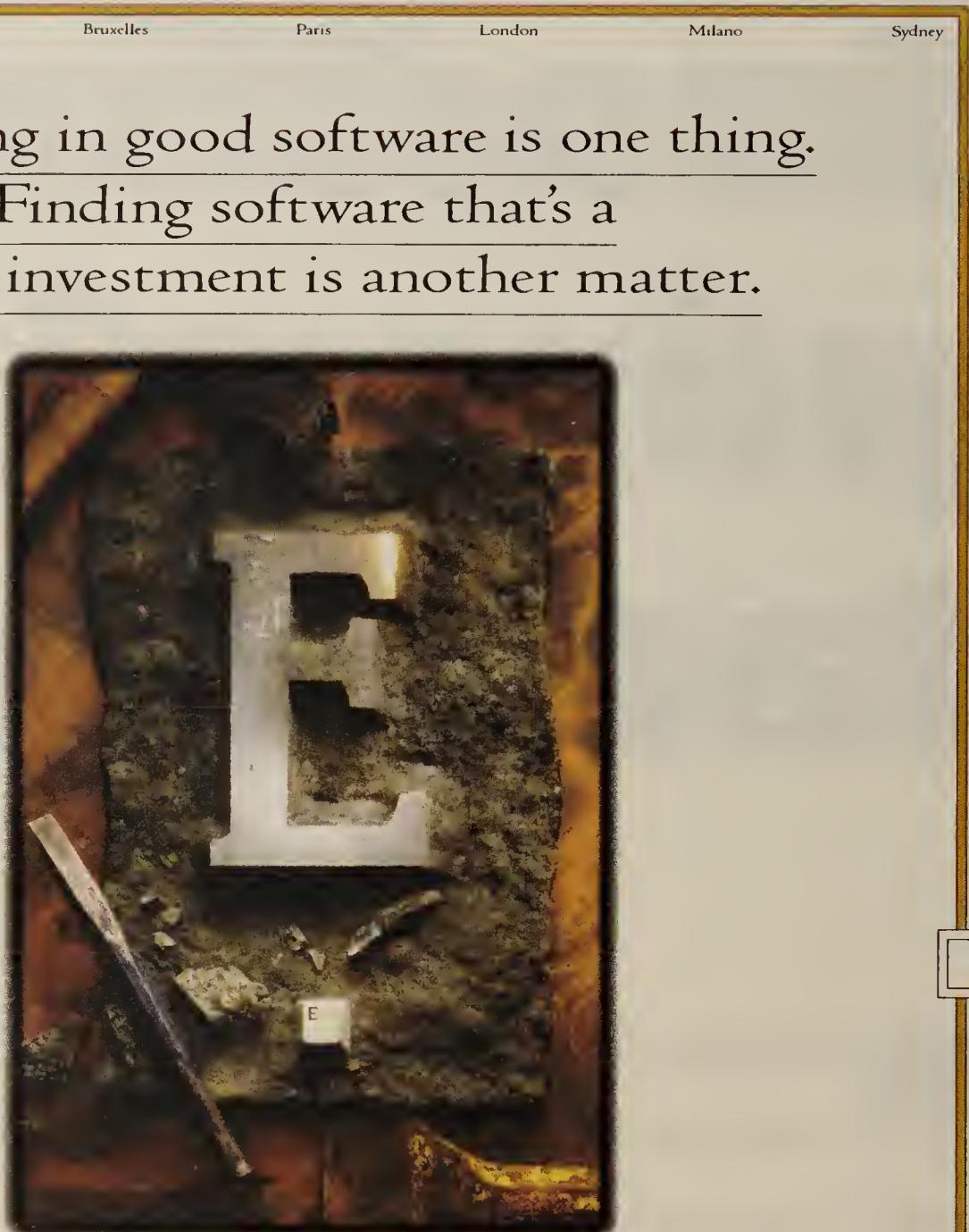
MANAGEMENT SHORTS

Banks keep outsourcing

Peoples Heritage Financial Group, Inc., a Portland, Maine-based bank holding company, has renewed its outsourcing agreement with **Systematics, Inc.** until the year 2000. Peoples owns Peoples Heritage Bank and Oxford Bank and Trust in Maine and First Coastal Banks, Inc. in New Hampshire. The firm's total assets are \$2.6 billion.

Pennsylvania State University won the \$10,000 top award from U.S. higher education business managers for an administrative innovation using information systems. Penn State developed an electronic approval system that allows many business forms to be electronically generated, approved and updated in the university's central database. The awards competition was sponsored by the Washington, D.C.-based National Association of College and University Business officers.

The Federal Home Loan Bank Board of Chicago has sold its item processing services business to Milwaukee-based financial data services vendor **Fiserv, Inc.** Terms were not disclosed. The bank board will continue to jointly market the services. It currently processes more than 60 million items annually for 91 financial institutions in Illinois and Wisconsin. It was Fiserv's second such acquisition this year. In May, Fiserv acquired the item-processing business of the Federal Home Loan Bank Board of Dallas.



Conventional wisdom holds that software erodes over time. New technologies and numerous, reckless code revisions chip away at the value of today's hottest seller.

At J.D. Edwards & Company®, we adhere to software design principles which actually improve the economics of software to the status of an appreciating investment: be obsessed with quality. Elevate software development from computer science to true craftsmanship. Pursue innovative uses for CASE technology and our World Software Architecture™.

The result is the broadest selection of software for the AS/400.™ Our software is easy to use, modify and maintain. It is simple to enhance and integrate. It offers an expertly crafted solution to ever-changing business requirements.

In an industry where your long-term investment is so easily worn away, J.D. Edwards & Company® stands rock-solid for lasting value—with business software for the IBM AS/400. For more information, call 800-727-5333.

JDEdwards®

TRADITIONAL VALUES. NEW TECHNOLOGIES.

World Software Architecture is a trademark of J.D. Edwards & Company. AS/400 is a trademark of IBM Corporation. ©J.D. Edwards & Company 1991. All rights reserved.

When it comes to overseas private lines, are you in over your head?



© 1990 AT&T

Undersea cable. Outer space satellites. Foreign regulation. Domestic regulation. Today's needs. Tomorrow's needs. At AT&T, we know that global communication management has more variables than ever before. So it's sometimes easy to feel a bit overwhelmed by the challenge.

But when you're with AT&T, you've got a partner with over 60 years of international experience. Relationships with phone companies around the world. And AT&T representatives

in 27 countries.

What that means to you is coordinated support for both ends of your private network. With services like single end ordering and billing, 24 hour single source troubleshooting and network monitoring. Plus AT&T will handle implementation issues like circuit provisioning at the foreign end.

We call this program AT&T Account Management Plus. It's an incredibly efficient way to manage your international private line. And

we provide it to you at no extra cost.

So before you make your next international call, call AT&T at **1 800 448-8600 ext. 444**.

And discover the advantages of a company with real depth in overseas services.

 **AT&T**
The right choice.

Du Pont's Emery targets IS/business gap

BY JOANIE M. WEXLER
CW STAFF

WILMINGTON, Del. — When Michael B. Emery dons the vice president of IS cap at Du Pont Co. Jan. 1, he will also assume the role of corporate diplomat.

Emery is slated to add the information systems post to his existing vice president of engineering responsibilities upon the retirement of 29-year Du Pont IS chief Raymond E. Cairns Jr. [CW, Oct. 7], whom Emery has worked alongside for 20 years.

In his dual position, Emery will straddle — and plans ultimately to meld — Du Pont's IS and business camps. The integration is being driven in large part by efforts to reduce Du Pont's U.S. expenses by \$1 billion annually. About 20% of that reduction is targeted at IS operations in the U.S., Emery said.

The cost-cutting will come

about by tightly interlocking IS and general business procedures and personnel in an effort to eliminate "second-guessing" users, Emery said. "It is not competitive to do that."

The IS/business consolidation will be facilitated by Emery's double vice president role on Du Pont's matrix-oriented senior management staff. The management setup was put in place a year ago by Du Pont Chairman Edgar Woolard as a system of checks and balances that has each senior manager reporting to multiple superiors and relying on all other executives' performance for success.



Du Pont's Emery takes over IS after 20 years on the business side

Emery said he has already taken the engineering department through that process and now plans to apply that expertise to the IS arena. That shift, which

he describes as currently unfolding, will involve Emery's encouraging business managers' acceptance of IS personnel as they learn the business ropes and migrate from "order-taker mode," Emery said.

IS staff "first need to be allowed to get their nose inside the tent; the business people have to be willing to take them on," Emery observed. He said he is in a unique position to drive that change by personal influence be-

cause of his experience and credibility. Because he spent 10 years as a business manager at Du Pont, he explained, he is not viewed as part of the IS staff.

A new breed

Emery joins a growing number of IS executives in the industry being recruited from the business side of the house rather than advancing through traditional IS ranks.

"I never expect to be at the level of IS competence as Ray Cairns," Emery acknowledged, adding that he does not believe in the philosophy that once a manager, an individual can manage anything.

An IS manager must be somewhat technically savvy, he asserted, adding that he developed his knowledge of IS by using it to run businesses. However, he said, "The notion of having a stand-alone IS organization of

6,000 [the size of Du Pont's worldwide IS staff] or an engineering organization of 20,000 is a thing of the past."

The reason: "Fifty percent of your grade is for technical competence; the other 50% is your ability to apply it to the business. You must be able to think several ways now."

The consolidation theme parallels ongoing worldwide IS moves to eliminate duplication of resources and to standardize on common architectures, per a master plan constructed by the retiring Cairns.

The plan includes changing work practices to operate with fewer heads and less hardware and software in a more simplified manner, "which doesn't necessarily mean centralizing and is different from outsourcing, where you get someone else to do something cheaper," Emery explained.

The re-engineered work practices are expected to result in \$100 million in annual cost reductions by 1993.

Futurist sees marketing rules turned inside out

BY MITCH BETTS
CW STAFF

Just when the information systems department is finally starting to understand the marketing department and build some marketing databases, the whole concept of direct marketing is about to go topsy-turvy.

In the next five to 10 years, dramatic changes in the direct marketing industry will produce such novel concepts as customer-solicited advertising, electronic catalogs and direct order-entry by consumers, according to industry futurist Donald R. Libey.

Libey, whose consultancy is



based in Haddon Heights, N.J., predicted that when consumers want to buy something in the next decade, they will look it up in an electronic catalog sent over a broadband fiber network to the home television/computer.

Consumers will then directly place their orders by computer and choose from an electronic menu of payment options. Billing will be handled by a centralized service bureau, which will replace the multitude of redundant billing systems at individual companies, Libey said.

Some of the futurist's predictions sound like heresy today. For example, the hot trend now is to build a consumer database

for highly targeted sales pitches and then feed and protect it as the company's crown jewels. Libey said that in the future, marketing databases will be open and shared.

He explained that "pods" of about 10 companies with non-competing product lines could share their databases for purposes of cross-selling. For example, a bookseller and a vendor of lawn mowers could cooperate to

CHANGES IN direct marketing will produce such novel concepts as customer-solicited advertising, electronic catalogs and direct order-entry by consumers.

identify homeowners who might buy gardening books.

Because of consumer unrest over the privacy issue, the trend will be toward "participatory databases" that allow consumers to select the types of personal information stored in them, Libey said. A consumer might allow the free trade of personal information in the grocery, reading and sports categories, for example, but not religion, charities or video rentals.

Libey said the job for IS executives is to convert today's flat files to no-hassle relational databases that provide different data views for different functional groups in the company.

They should then add a layer of artificial intelligence to help users analyze the buying trends, he advised.

CALENDAR

DEC. 29-JAN. 4

ADS Technical Symposium. Tucson, Ariz., Jan. 4-10 — Contact: Rob E. Zenuk, Tucson Medical Center, Tucson, Ariz. (602) 327-5461.

JAN. 12-18

Pacific Telecommunications Conference. Honolulu, Jan. 12-15 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

Network Management Seminar. San Francisco, Jan. 13 — Contact: AG Group, Walnut Creek, Calif. (510) 937-2479.

The 14th Annual ATE & Instrumentation Conference. Anaheim, Calif., Jan. 13-16 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

Amiexpo. Long Beach, Calif., Jan. 14-16 — Contact: Amiexpo, Valhalla, N.Y. (914) 741-6500.

Scientific and Engineering Applications of the Macintosh. San Francisco, Jan. 15-17 — Contact: Macsofttech, Worcester, Mass. (508) 755-5242.

JAN. 19-25

Uniform '92. San Francisco, Jan. 22-24 — Contact: Bob Linke, Professional Exposition Management Co., Carol Stream, Ill. (708) 260-9700.

Nextworld Expo '92. San Francisco, Jan. 22-24 — Contact: Jeannine Barnard, World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 26-FEB. 1

The AS/400 Help Systems Operations Automation User Conference. Orlando, Fla., Jan. 27-30 — Contact: Help Systems, Inc., Minnetonka, Minn. (612) 933-0609.

Improving Productivity in Systems Development. Phoenix, Jan. 27-31 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

ComNet '92. Washington, D.C., Jan. 27-31 — Contact: Rachel Winett, World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 2-8

Infotext. Las Vegas, Jan. 28-30 — Contact: Infotext Publishing, Inc., Capistrano Beach, Calif. (714) 493-2434.

8th Annual Computer Graphics Show. New York, Jan. 28-30 — Contact: David J. Small, MIJO, Inc., Silver Spring, Md. (301) 587-4545.

FEB. 9-15

Information Management Conference. New York, Feb. 4-5 — Contact: The Conference Board Registrar, New York, N.Y. (212) 339-0290.

FEB. 16-22

Computer Graphics '92. Walt Disney World, Orlando, Fla., Feb. 10-12 — Contact: Sheila A. McDonald, Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Networld '92. Boston, Feb. 11-13 — Contact: Annie Z. Scully, Bruno Blenheim Associates, Englewood Cliffs, N.J. (201) 596-8542.

Dexpo. Calgary, Alberta, Feb. 11-13 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

FEB. 23-29

Information Security Managers Symposium. San Diego, Feb. 18-20 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Seybold Seminars '92. Boston, Feb. 18-21 — Contact: Beth Sadler, Seybold Seminars, Malibu, Calif. (213) 457-5850.

XEDIT

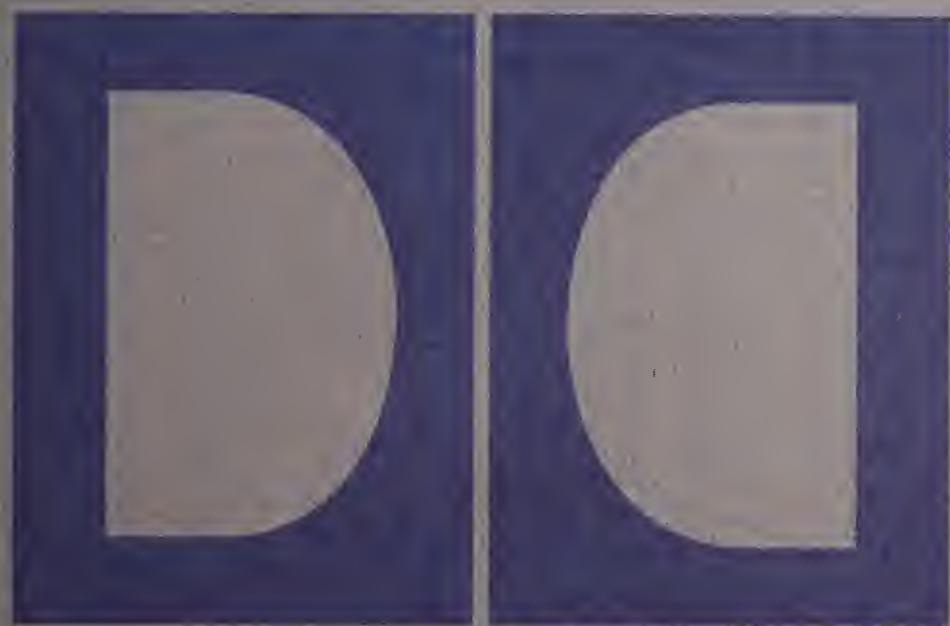
For Unix
REXX too...

Order uni-XEDIT and uni-REXX today.

800-228-0255

wrk/grp
the workstation group

When you develop a standard, the world listens.



Dolby® Noise Reduction



UNIX® System V Release 4

When you're looking for stereo equipment, you know that products bearing the Dolby Laboratories symbol incorporate the standard for quality audio technology. Now there's similar reassurance when you look for a UNIX®-based solution. The UNIX SVR4 symbol identifies the proven, industry standard.

What does this symbol represent? It represents the one UNIX System that is the selected base operating system of 88open, the INTEL Consortiums,

SPARC International and the ACE Consortium. It represents the one UNIX System that is commercially proven in over one million installations and compatible with more than 18,000 applications. It represents the one UNIX System that is supported by more than 80 percent of open systems vendors.

But most of all it represents the one UNIX System that sets the standard by which all others are measured. It's no wonder UNIX SVR4 was recently named the best software product

in 25 years by *Computer Weekly* of the United Kingdom.

So when you're looking for a UNIX-based solution, ask your open systems vendor for the standard that everyone is talking about: UNIX SVR4. Or call UNIX System Laboratories, Inc. Tel: +1-800-828-UNIX, or +1-908-522-6000.



UNIX SVR4 THE STANDARD BY WHICH ALL OTHERS ARE MEASURED

UNIX is a registered trademark of UNIX System Laboratories, Inc. in the U.S. and in other countries.

Dolby® and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation, which is not affiliated in any way with UNIX System Laboratories, Inc.



If you want to lead in new technology,

By any standard, one company is the premier supplier of CASE (Computer-Aided Software Engineering) tools for business applications development. KnowledgeWare was the first to use a Graphical User Interface. First to deliver an integrated, PC-based COBOL code generator. First to offer OS/2-based full life-cycle solutions. And first to incorporate Rapid Application Development techniques. KnowledgeWare's comprehensive CASE tools are already serving more than 64,000 users in 3,300 companies. And our partnership in IBM's[®] AD/Cycle[™] vision protects the value of your investment. Today, KnowledgeWare is moving vigorously to meet customers'



KnowledgeWare
CASE

you don't follow trails. You create them.

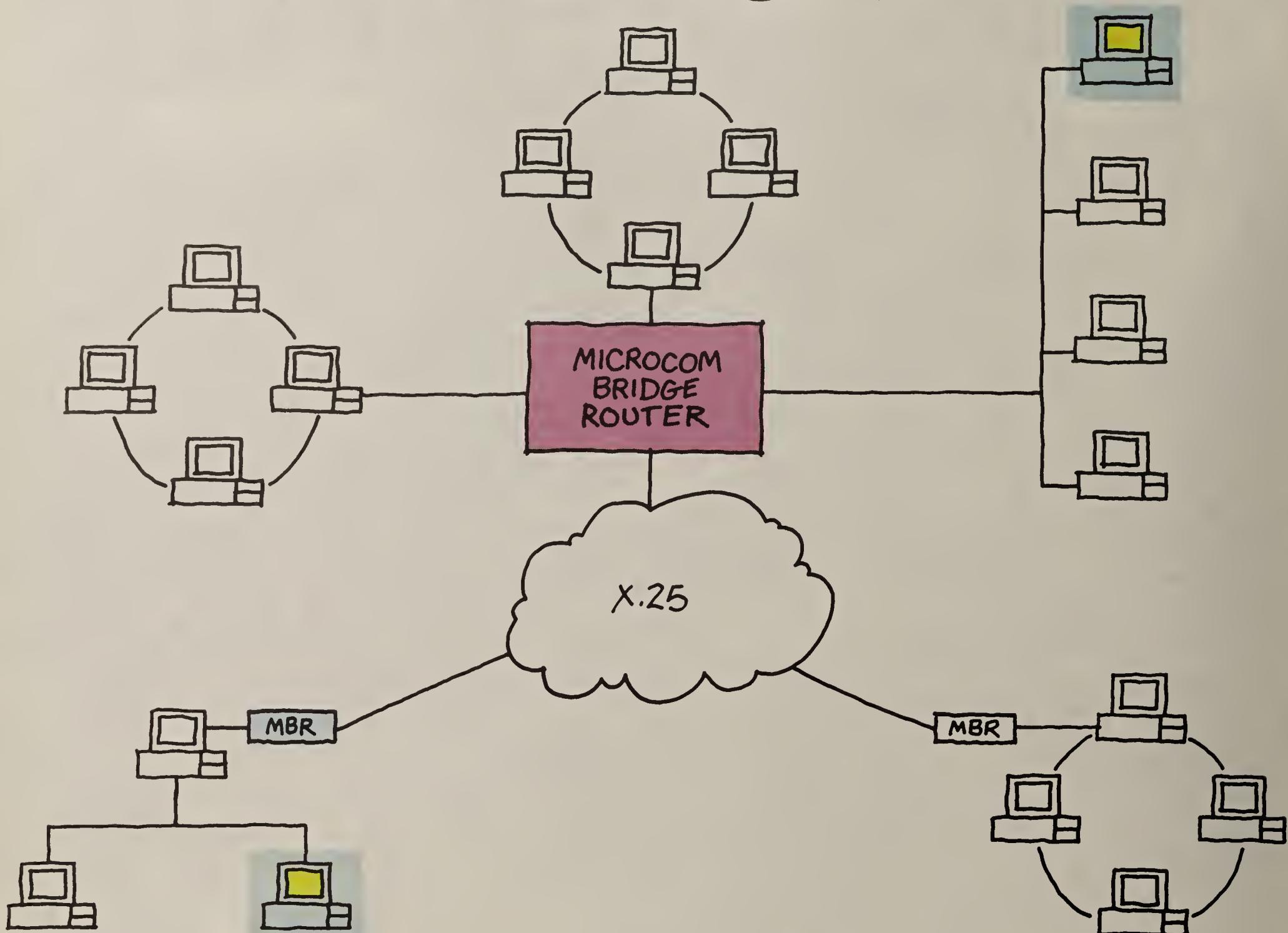
needs for application development tools that address re-engineering of existing applications, and tools that support building new applications for the client/server, AS/400 and cooperative processing environments. As application development tools evolve to address a broader range of requirements, KnowledgeWare is working to be there first. Call 1-800-338-4130 for our free color brochure. With a partner like KnowledgeWare, you're always one jump ahead of the competition.

AD/Cycle is a trademark and IBM and OS/2 are registered trademarks of the International Business Machines Corporation.



KnowledgeWare®
THE BEST CASE FOR YOUR BUSINESS

Microcom can get you there.



From here.



Until now searching for a simple answer to bridging and routing for PC LANs led network managers to a dead end. Not so anymore. Because with the Microcom Bridge/Router™ you get an easily configured solution that finds not only the shortest path to forward data, but the fastest.

Which means that you get a router that optimizes performance in Novell networks and provides SRT support. Plus a transparent bridging solution that automatically forwards any data packet that can't be routed. That makes for simple, straightforward connections to Token Ring® and Ethernet® networks.

What's more, the MBR™ features 4:1 data compression to move information faster than ever before. So you save time and line costs whether you use leased lines or an X.25 network.

In short, no matter where you want to be, the Microcom Bridge/Router will get you there.



Call **1-800-822-8224** today for more FREE information including "The New Guide to LAN Internetworking" or the FREE video "LAN Internetworking Fundamentals" or complete and mail or fax this coupon to Microcom.

Please send me: "The New Guide to LAN Internetworking" "LAN Internetworking Fundamentals" video

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Telephone _____

C12/2



Technology Guides

500 River Ridge Drive, Norwood, Massachusetts 02062-5028
(617) 551-1000, Fax: (617) 551-1021, International Fax: (617) 551-1007

PRODUCT SPOTLIGHT

LAN operating systems

Choosing the right one may not be as easy as you think; potential buyers must match capacity limitations and application needs

BY JUDD VOLINO

Local-area network operating systems are the focus of intense attention these days as many companies downscale major applications to network-based platforms.

However, not all LAN operating systems are equally suited to every business environment. Choosing the wrong operating system can lead to disappointment at best and disaster at worst.

Performance capability, the variety of connection options available and facilities for administration are key factors that managers should assess to determine whether a particular product is suited to their needs.

At minimum, a LAN operating system operates as an additional layer above the basic operating system on networked personal computers and/or workstations, adding the capability to communicate with other machines and use resources beyond those attached locally.

Low-end savings

In many cases, a low-end LAN operating system can provide a cost-effective means for linking members of small work groups who need to share files and printers. Products in this category generally use a peer-to-peer approach, sharing the resources of individual desktop machines rather than relying on a central file/print server.

Typically, a small memory-resident program takes care of disk and print spooling requests in the background, while users continue to use their machines for other applications.

Such a scheme can help reduce the initial investment required to bring a basic level of network services to small-scale installations.

The following is a list of the savings derived from a low-end

Volino is staff consultant for Enterprise Technology Center, a Houston-based independent demonstration and evaluation center for network and client/server computing.

LAN operating system approach:

- Lower purchase price compared with high-end systems.
- No need to purchase a dedicated server.
- Ability to tailor the number of LAN operating system licenses to the exact number of users requiring LAN services.
- Potentially reduced network

as Artisoft, Inc.'s Lantastic and Performance Technology, Inc.'s Powerlan are as good as — and in some cases, better than — their big brothers'.

Beware of limits

A low-end LAN operating system can be a good choice for a first step or for situations in which budgets and/or network-

be physically secured.

Disk-intensive applications such as databases can also negate the benefit of a non-dedicated server if performance degradation makes the server unusable to its primary owner. Likewise, if that owner is running programs that require lots of memory and processor time, other users will feel the impact.

Thus, when considering a low-end LAN operating system, it is very important to examine what sorts of applications will be running on the LAN, both immediately and in the near future. It's wise to weigh the current financial benefits against future limits of the system.

High-end LAN operating systems guarantee strong performance under strain, a wealth of options for bridging the gap between heterogeneous computing platforms and facilities for managing larger numbers of users and servers.

These products include Banyan Systems, Inc.'s Vines, Microsoft Corp.'s LAN Manager and Novell, Inc.'s Netware 3.0 series platform. If the goal is to simply put together a system that provides many users with easy access to a suite of standard applications and printing resources, any high-end LAN operating system can meet it. The question becomes one of how smoothly the process goes.

Determining differences

If time is of the essence, look at the ease of setting up a given server and preparing workstations to access it. The leading products vary in their complexity when it comes to installation.

Vines is cited as the quickest product to finish setup because of its high level of automation. Both Netware and LAN Manager require the user to perform a number of manual steps to complete installation. LAN Manager's design also requires installing IBM's OS/2.

Preparing a workstation to connect to the network is still no job for a novice, but Microsoft offers a menu- and mouse-driven approach that makes it easier.

Continued on page 76



Ron Chan

adapter costs and setup time.

As for performance and capability, peer-to-peer systems can make a good showing next to higher priced counterparts. Laboratory testing has shown that when loads are light, the speed of some low-end systems is comparable to that of high-end ones.

Furthermore, the management software and user interfaces provided by products such

ing demands are limited. When needs and the user base broaden, however, the restrictions inherent in peer-to-peer systems will become evident.

For example, products of this type that use the standard DOS file system are limited to its security attributes. And regardless of security features, nondedicated servers are a high risk because, by definition, they cannot

INSIDE

Adapting Application

How well will your application run on your LAN?
Page 77.

Buyers' Scorecard

Vines outscores competitors in user ratings.
Page 84.

Product Guide

A list of DOS and OS/2 LAN operating systems.
Page 88.

Choosing the right one may not be easy

CONTINUED FROM PAGE 75

In any company that plans to make use of the LAN beyond basic resource sharing, the ability of a LAN operating system to support growth is a key issue. Choosing the best product requires determining the areas in which demands are most likely to increase.

Large capacity LANs

For an installation with a rapidly growing user base, Vines and LAN Manager have an advantage because of their licensing plans and their ability to economically accommodate an extremely high number of users. Both Banyan and Microsoft sell their respective unlimited and 1,000-user packages at prices below that of Novell's 250-user option.

Storage capacity and response performance become especially relevant when client/server applications have been (or may be) implemented. The size of the applications being implemented on the LAN actually continues to grow astronomically at many firms.

Document imaging systems, for instance, require that the LAN operating system be capable of addressing huge amounts of hard storage.

When large amounts of storage are required, LAN Manager's tight restriction to 16M bytes of random-access memory and Vines' limit of 2.4G bytes of total disk storage per server might pose a problem.

Netware, on the other hand, claims a maximum of 32T bytes for disk storage and 4G bytes of physical RAM on the server.

Netware is also the overall winner when it comes to raw response speed, outpacing its competitors in a number of laboratory tests. Again, this finding is most important for companies in which activities such as heavy database access will put a strain on individual servers.

Multiplatform support

Managers trying to tie together a heterogeneous computing environment should add multiple-platform support to the list of considerations in choosing a LAN operating system.

The leader in the field of support for non-DOS and OS/2 workstations is Novell. For companies that want to make a server's file and print services directly available to Apple Computer, Inc.'s Macintosh and Unix clients, Netware is really the only

choice available.

LAN Manager lacks Macintosh support altogether; Vines requires a separate gateway. Note, however, that Netware's Macintosh and Unix support is

er or gateway options for IBM 3270 terminal emulation and Systems Network Architecture connectivity, administrators especially praise Vines for its well-integrated solution, which makes host access seamless for the end user.

Managers who anticipate building a wide-area network

extra hardware or software to do bridging and routing over a connection that carries a supported protocol such as Transmission Control Protocol/Internet Protocol.

Operating in the context of a WAN can make the task of network management difficult, at best, without support from the LAN operating system.

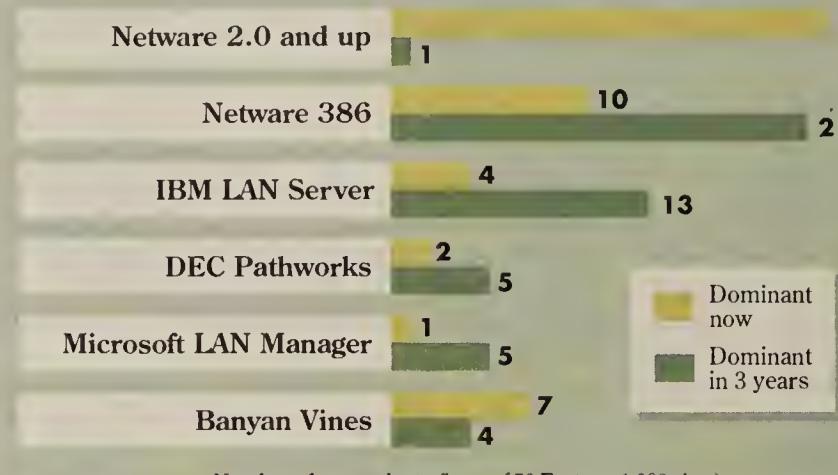
Perhaps Vines' most talked about feature is its global naming service, Streettalk. Streettalk is, in essence, a distributed database that contains the names of all resources, users and groups on the entire network. LAN Manager's domain system and Novell's optional Netware Naming Service do not yet achieve this sort of truly global functionality.

While all of the vendors are working to improve their offerings, one thing is clear: The more a company needs from its LAN operating system, the more closely managers should look at competing products.

Regardless of the company's needs, the purchase of a LAN operating system is a matter that should not be taken lightly. •

LAN operating system leaders

Which LAN operating system will be dominant now and in three years?



Source: Forrester Research, Inc.

CW Chart: Marie Haines

not standard; it must be purchased at a premium price (see story below).

The creation of a LAN does not always imply an end to the use of larger hosts, either. While all of the high-end vendors (and many third parties) provide serv-

from their LANs should confirm that the LAN operating system supports connection alternatives that meet their company's needs.

Vines' WAN capabilities have been lauded by integrators. Unlike its rivals, Vines requires no

Hidden costs in using a LAN operating system

BY CHRIS CHANCE
and JUDD VOLINO

For many companies, the purchase of a local-area network operating system is part of an overall cost reduction scheme. They hope to replace more expensive processors with a personal computer network.

The cost of a single LAN operating system package does indeed appear to be a bargain in this light. However, many managers soon find out that it takes more than what comes in a shrink-wrapped package to build a network that serves their needs. While these additional costs are rarely prohibitive, they are nonetheless significant.

Taking all possible items into consideration, the total cost of installing a 20-node LAN is about \$105,000. This figure increases to about \$500,000 for 100 nodes and \$4.8 million for 1,000 nodes.

Supplementary software can be one of the largest expenditures. The magnitude of this cost depends on the breadth of the installation's requirements.

If connectivity requirements go beyond basic DOS and OS/2 platforms, expect to pay a pre-

mium for additional platform support. For instance, Novell, Inc. offers support for Apple Computer, Inc. Macintosh and Unix, Network File Systems and connections as separate packages that range from \$895 to \$4,995, depending on the number of users. Gateways to IBM's Systems Network Architecture and other such services, usually provided

by third-party vendors, can also run in the several thousand-dollar range.

At the outset, it may also be necessary to upgrade some existing applications to versions that are LAN operating system-compatible. Typically, these upgrades cost anywhere from \$50 to \$200 per license. Moreover, new copies may need to be added

because most packages require a license to be purchased for each potential user. None of the major vendors currently include built-in license control. Third-party products, such as Brightwork Development, Inc.'s Sitelock, can add this capability for \$300 to \$700 per server.

The cost of intangibles such as software support can add up

Costs add up

The following estimated costs represent what it takes to implement a LAN operating system in a typical office environment

OPERATING SYSTEM SOFTWARE

The software:

Low-end packages: \$100-\$200 per node
High-end packages: \$995 (five users), \$5,495 (unlimited), \$12,495 (250 users)

Management tools: More important in sites with over 25 nodes

Network monitor: \$300-\$2,000
Administration add-ons (usage tracking, auditing, etc.): \$300-\$1,000 per server

End-user interface: Used especially in office environments

Menu generators: \$300-\$500 per server

PERSONNEL

One to 15 stations:

Half of a full-time equivalent (FTE) employee
16-50 stations: 1½ FTE employees
(add a dedicated support person at \$28-\$33K per year)

50-100 stations:

Two FTE employees
(add a professional MIS manager at \$40-\$52K per year)

HARDWARE

Concentrator: Required in any star/ring topology

Arcnet: \$500 (eight ports)
10Base-T: \$1,300 (12 ports), \$8,000-\$12,000 (36 ports),
\$35,000-\$40,000 (132 ports)
Tape backup unit: \$1,500-\$10,000

REMOTE SYSTEM

Remote dial-in:

Generally one dedicated CPU and modem required per line (plus monthly phone line fees)

SPACE FACILITIES MANAGEMENT

Secure room and storage of spare parts (raw lease cost per sq ft)

Build-out cost: \$20-\$28/sq ft
Air-conditioning system: \$2,000
UPS/Power conditioning: \$1,000-\$3,000
Site survey (evaluate cabling, power resources, etc.): \$750-\$1,800

Making applications fit your network

BY ERIC SMALLEY

Managers dealing with local-area network applications are faced with two unique challenges:

- 1) Matching their setup to what the application developer defines as a LAN environment.
- 2) Addressing user expectations of application performance and capability.

These issues are not major problems for stand-alone or mainframe and minicomputer applications because these developers generally know the user environment better, and users are generally more accustomed to the attributes of their applications.

For example, vendors of stand-alone applications know that the user platform will be an Intel Corp.-based or similar personal computer running DOS or one of a handful of operating systems.

But when vendors offer LAN applications, there is less understanding of what the user environment looks like. Key conditions that vary from site to site include the following:

- Is the server PC-based?
- Are there five workstations per server or 25?
- Is the LAN Token Ring or Ethernet?
- Is the LAN operating system Novell, Inc.'s Netware, Banyan Systems, Inc.'s Vines, Microsoft Corp.'s LAN Manager, IBM's PC LAN or LAN Server, Digital Equipment Corp.'s Pathworks or some brand of peer-to-peer software?

No guarantees

Some application vendors claim that their products run on any LAN. However, the applications don't always perform as billed, according to Jay Joiner, manager of technical services at Ebasco Constructors, Inc. in Lindhurst, N.J.

"Don't assume it'll run like it's supposed to," he says, noting that some applications rely more heavily than others on features of particular network operating systems.

In short, the environment is more complex and variable than a stand-alone system. Keeping an application up and running on a LAN involves servers, workstations, links between them and various pieces of software, all of which have to be working together.

Managing performance of these interconnected systems is another challenge. Popular per-

ceptions to the contrary, it is inaccurate to take the aggregate CPU power of the nodes on a LAN and compare their performance to that of a minicomputer or mainframe. The power and I/O throughput of the server and the bandwidth of the network are factors that must be taken into account.

"You have to understand performance and tuning considerations in a network environment," says Jim Crain, manager of the Client Services Division of the information services department of the city of Los Angeles.

Tuning can be as simple as adding memory to the server or as complicated as determining which files should be kept locally and which should be stored on the server.

Disappointed users

Problems arise when users new to LAN applications bring their old expectations of mainframe,

LANs or converted from a stand-alone version.

Moving a single-user program to a LAN requires considerable revisions, according to Mark Theoharous, manager of Andersen Consulting's Network Solutions Practice. For example, a word processing program that was not written to support multiple users would require the addition of a shared dictionary, file locking and the ability to set different parameters for different users.

"LAN applications should exploit some version of the client/server architecture," says David Daniels, manager of executive information at the Investment Information Division of Metropolitan Life Insurance Co. "I haven't been too impressed with PC applications that were originally designed for stand-alone PCs."

Tricky DBMSs

Database management systems are an especially complicated example of stand-alone applications that must be moved to the LAN. Databases in multiuser environments require record locking as well as file locking.

The ideal LAN application allows users across the network to work on a shared project. Shared applications, sometimes called groupware, are analogous to telephone conference calls in which more than two people can exchange information at the same time.

"LAN applications should enable people to collaborate," Daniels says. "They should enable group information, group thinking, group problem solving."

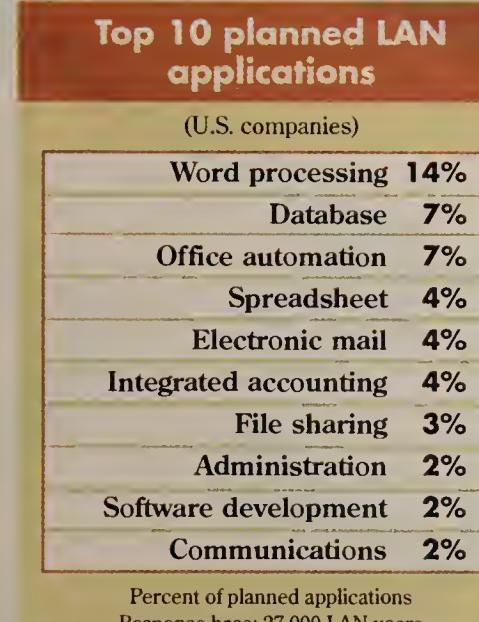
Many vendors are attacking this problem. For example, Lotus Development Corp. is developing a shared version of its 1-2-3 spreadsheet.

The project, code-named Chronicle, will add a finer level of sharing to 1-2-3 by allowing multiple users to add data to a spreadsheet at the same time, according to Jeffery Beir, general manager of spreadsheet products at Lotus.

In general, these shared applications will involve integrating applications more closely with electronic mail, according to Theoharous. E-mail becomes the so-called "middleware" between the network operating systems and user applications.

To date, shared applications on the market tend to be bundled packages encompassing multiple office automation tools, according to Theoharous.

"Getting best of breed is more important," he said, adding that vendors should integrate individual types of applications with E-mail. •



minicomputer or even stand-alone PC performance to the new experience.

A user familiar with stand-alone PCs will likely be pleased but not surprised by the ability to communicate and share information with other users on a LAN.

However, users familiar with mainframes and minicomputers could be disappointed by the lower reliability and security of a LAN. They may also be pleasantly surprised by the ease of use and greater scalability.

These expectations are also governed by how a user defines LAN applications. Definitions range from a stand-alone PC application on a LAN node being able to store files on a server to multiple users simultaneously running shared applications on the network.

A key distinction to bear in mind when looking at LAN applications is whether the application was originally written for

How open is open?

Few LAN operating systems are purchased today without the buyer's asking whether the system works in a heterogeneous computing environment. Increasingly, vendors are answering that question with a resounding yes.

However, behind that positive response are varying definitions of how open the operating systems are.

The following is a sample of where the differences lie among leading vendors:

- Perhaps the most "open" LAN operating system is Sun Microsystems, Inc.'s ONC/Network File System (NFS) technology, which was released to the public after it was developed in 1985, allowing any vendor to incorporate it into its product offerings. This strategy helped ONC/NFS become a de facto standard for Unix connectivity and may help it become a threat in the DOS market, in the absence of other standards.

According to Sun, the ONC/NFS implementations for DOS-based PCs, including Sun's PC/NFS, are now installed on 750,000 units. The technology has also been endorsed by the X/Open Consortium Ltd. and the Open Software Foundation.

- DEC's Pathworks is open to the extent that it offers users a choice of clients (Apple Computer, Inc.'s Macintosh, DOS, OS/2, Microsoft's Windows) and a choice of servers (OS/2 on Intel processors, Ultrix on reduced instruction set computing systems and VMS on the VAX). In addition, Pathworks conforms to a variety of network operating system or file and print service protocols today, including Microsoft's LAN Manager and Apple's Appleshare. The firm also offers a Novell Netware coexistence product.

- Apple's Appletalk network products are supported in Netware, LAN Manager and Banyan's Vines, and as part of the alliance with IBM, they will be incorporated into OS/2. The products can be purchased through DEC and from AT&T on some of their Unix systems.

Even with these support agreements, LAN operating system products are still tied to proprietary protocols. "Their native mode is essentially proprietary," says David Passmore, a partner specializing in network consulting at Ernst & Young's Fairfax, Va., office.

For example, Netware relies on IPX/SPX, Apple uses the Appletalk Filing Protocol on top of the Appletalk protocol stack, Banyan runs its own version of Xerox Corp.'s Xerox Network Systems, and LAN Manager uses a set of Netbios protocols.

GARY ROBINS

Robins is a free-lance writer based in Northfield, Minn.

System Managed Storage in your future?

So is Empact Software.

Like many MVS Data Center Managers, you look forward to a system free of DASD management worries. IBM's DF/SMS is an excellent first step and STOP-X37 from EMPACT Software brings you even closer.

STOP-X37 works with SMS to prevent space problems and to improve DASD utilization. STOP-X37 stops B37, D37, and E37 abends, VSAM out-of-space conditions, and other space related problems. The space problems that SMS alone cannot prevent.

Call EMPACT Software today to ask about STOP-X37 Version 3.4 -- the release designed specifically for SMS environments.

Phone (404) 483-8852

Fax (404) 388-9453

EMPACT
SOFTWARE

EMPACT Software / 2375 Wall Street / Conyers, GA 30208

DF/SMS is a registered trademark of IBM corporation

Perhaps the most ama PC is that it can



At NEC, we put as much emphasis on affordability as we do on upgradability. Add a Pinwriter® P3200 and a MultiSync 3FGx to your Image Series PC and you can do high-level computing without paying a high price.

Anyone who thinks you can't do anything with a quarter these days obviously hasn't seen NEC's new PowerMate® Image™ Series SX/16i and SX/20vi PC's. With their tool-less design, all it takes to open them is the quick turn of a quarter. Then you can customize your computer yourself as your needs change. For instance, you can increase your system or video memory by just plugging in chips. And storage devices easily snap into place, too. We've even made it easier to upgrade your system in the future. Simply send us your old Image motherboard and we'll credit



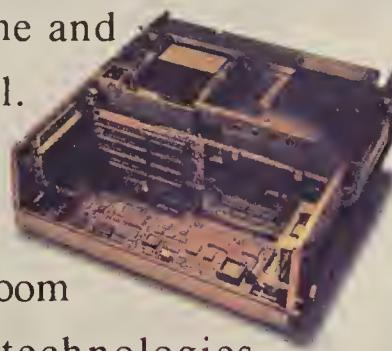
C&C
Computers and Communications

PowerMate, MultiSync and Pinwriter are registered trademarks and ImageSync, Image Series and FG are trademarks of NEC Technologies, Inc. MS DOS and Windows are registered trademarks of Microsoft Corporation. PFS, Window Works is a trademark of Spinnaker Software Corp.

zing thing about our \$1,199* be upgraded with a quarter.

its value towards a new one.** And we don't just give you a faster CPU, either. We can give you more memory, cache and video, as well. But that's not all.

There's also space for additional drives.



So you have room for new technologies like CD-ROM. And like the rest of our Image Series PC's, the SX/16i and SX/20vi come with plugs and jacks that make them multimedia ready. There's ImageSync™ technology for flicker-free graphics when used with our new MultiSync® FG™ monitors.

FLASH ROM for upgrading or enhancing your BIOS via diskette. And pre-loaded MS-DOS® 5.0, Windows® and PFS: Window Works.™ For more information, call 1-800-NEC-INFO, or NEC FastFacts at 1-800-366-0476, #IMAGE (46243). After all, a computer isn't worth a dime unless you can upgrade it with a quarter.

Because ↑ is the way you want to go.

NEC

Users struggle with LAN licensing agreements

BY DEBORAH ASBRAND

The proliferation of local-area network applications is a mixed blessing for network administrators.

As LAN software has become increasingly varied and sophisticated, so have the licensing agreements that govern the software's use. The result is that network managers find themselves spending greater amounts of time ensuring compliance with licenses that restrict use by site, buyer or node.

"It's a constant struggle," says Lori Perry, manager of systems technology at Coal Service Corp., a wholly owned sub-

sidiary of Peabody Holding Corp. in St. Louis. "The inconsistencies and lack of standards among the products" are the source of many hassles, she says.

While some vendors such as Sun Microsystems, Inc. have developed license-managing software that tracks and details network activity, in most instances, managers like Perry are left to sort through the language of license agreements on their own.

However, corporate end users are be-



ginning to publicize their frustrations and seek better solutions. At its annual meeting in October, the Microcomputer Managers Association (MMA) issued a widely quoted paper stating the licensing needs and preferences of its 750 members.

In addition, momentum is building to the point where vendors that offer favorable licensing policies will gain an important sales edge over competitors with more restrictive policies, according to an

alysts and network managers.

Network license agreements stipulate product use in a number of ways: by site, by concurrent use, by machine or by individual. The problem for network managers is that they're often juggling the administration of several different types of licensing agreements.

According to the MMA, managers support concurrent-use licensing as the method most likely to ease the strain. Under the terms of such agreements, a firm buys a number of copies of a software package and runs them on the network. Metering software is also installed to track the program's use.

Concurrent-use licenses cut deeply into software publishers' profits, however. "If you sell a concurrent license, you're going to cut the number of copies you sell by 20%, and vendors are concerned about that," says Jeffrey Tarter, editor of the newsletter "Softletter."

In fact, because software vendors have only recently begun to realize profits from the network versions of their products, many are still learning how their customers use network applications.

"The access-control mechanisms differ depending on the patterns of usage and the numbers of copies they use," says Jim Geisman, a consultant at Market Share, a Wayland, Mass.-based management consulting firm specializing in software licensing and pricing. "Managing a network used by a stable work group of engineers, for example, is different from running one used by 400 office workers."

No time to waste

However, vendors need to catch on quickly. The market for networking products is fast becoming crowded and competitive, and it's likely that more vendors will turn to favorable licensing policies as sales tools. Until now, Geisman says, software vendors have been copy-centric. "The real issue for them is growth, not just 'How many copies are we going to sell?' They don't realize that the people who bought this year aren't going to buy again next year."

As managers install and expand LANs, they're keeping a close watch on costs. The 7,500 agents supported by Donna O'Driscoll and her staff at New York Life Insurance Co. are just starting to run LANs in their field offices. "Our agents are concerned with expense," she says. "When we look at packages, [the license agreement] will be a determinant in the software we choose to use."

Mansfield, Mass.-based Kendall Health Care runs little more than electronic-mail applications on its 350-user LAN because few of the software packages it has considered meet the firm's configuration requirements. "Network versions aren't available in user quantities that fit our needs," says Roy Wilske, manager of end-user services.

The buying criteria Wilske used for his most recent software purchase indicate why end users may have the last word on licensing issues: Wilske based the purchase of a database package on the product's five-person increments and its easily understood licensing procedures.

"We have a small support staff, and we don't have the resources to solve all kinds of crazy problems. The products we buy have to be simple and straightforward for us to maintain," he says. •

Asbrand is a Boston-based free-lance editor and writer.



CASE WORLD

CONFERENCE & EXPOSITION

Chaired by Ed Yourdon

SANTA CLARA, CA
FEBRUARY 18-20

'92

Four Conferences in One Event!

1. Enterprise CASE
 - Business-Driven Information Engineering
 - CASE for Enterprise Modeling
 - Repository & AD/Cycle
2. Re-engineering
 - Re-engineering & Reality
 - Software Re-usability
 - Business Re-engineering
3. Software Development for Open & Micro Systems
 - LAN-Based Applications
 - Object-Oriented & C++
 - CASE for Software Developers
4. Real-Time CASE
 - Embedded Systems
 - DoD2167A
 - ADA 9X

Five Days of Education

- Feb. 18-20 — The Complete CASE WORLD Conference
- Feb. 17 & 21 Nine Elective Seminars

Intro to CASE Curriculum

Special CEO & CIO Panels

10 Technical Tracks

Featuring over 100 Speakers including:

- Grady Booch
- Bill Curtis
- Clive Finkelstein
- Randall Jensen
- Capers Jones
- Tim Lister
- Vaughan Merlyn
- Ken Orr
- Roger Pressman
- Howard Rubin

The Exposition

Over 100 CASE & Application Development tool companies will be at CASE WORLD including:

- Andersen Consulting
 - Bachman Information Systems
 - Cadre Technologies
 - Computer Associates
 - Digital Equipment
 - Hewlett-Packard
 - IBM
 - Interactive Development Technologies
 - Interleaf
 - KnowledgeWare
 - Oracle
 - Texas Instruments
- and many more!

Interested in exhibiting?
Call (508) 470-3870.

**Call
(508) 470-3880
to Register or
to Receive a
Detailed
Brochure.**



Digital Consulting, Inc.

Co-Sponsors:

INFORMATION WEEK

Dr. Dobb's JOURNAL

* Service mark of Digital Consulting, Inc.

1A21WC

The National Application Developer's Conference and Exposition

MEET OUR MANAGEMENT TEAM

"No two networks are alike. By manufacturing and developing the industry's broadest product line, we can tailor any network to our customers' needs."

S. Robert Levine
President & CEO



Ethernet, Token Ring and FDDI

At Cabletron Systems, we recognize the integrated networks of today provide your company with the competitive advantage it needs tomorrow. In response to your needs we've developed the broadest product line of leading-edge technologies that fully integrate under Cabletron's powerful network management umbrella.

Intelligent Hubs

Cabletron's Multi Media Access Center intelligent wiring hub series connects Ethernet, Token Ring and FDDI local and wide area networks together in a single chassis. Our other hub products include standalone devices for 10BASE-T and Token Ring smaller connectivity environments.

Management Platforms

Remote LANVIEW®/Windows, the industry's first management software solution for SNMP

Ethernet and Token Ring networks, was the world's first network management software package to offer completely integrated worldwide desktop LAN/WAN management from a central control console.

And now we've brought network management to a new level with SPECTRUM™, Cabletron's advanced management platform, that goes far beyond the current generation of management systems to provide a cohesive, powerful and flexible environment for managing multi-vendor networks.

CABLETRON
SYSTEMS^{Inc.}

The Complete Networking Solution

Corporate Headquarters

35 Industrial Way, Rochester, NH 03867-5005
(603) 332-9400

Desktop Connectivity

Of course there's more, including Cabletron's own Ethernet and Token Ring Desktop Network Interface (DNI®) adapter cards, the industry's first manageable adapter card solution; as well as our entire line of manageable 10BASE-T and Token Ring connectivity products.

It is easy to see why Cabletron has become the leader in network management technologies. That's why over 22,000 customer sites already use our products to connect more than 2 million network nodes. Use Cabletron's network management team to give your company the competitive edge it needs.

With more than 35 offices worldwide, there's a Cabletron location near you. Call us today at our headquarters for our product brochures or to arrange a live demonstration.

A better way to increase workgroup productivity is just around the corner.

Contact a VAR near you for the Lotus Notes® solution for your company.

California

Distributed System Solutions

International (DSSI)

5655 Lindero Canyon Road

Building 100

Westlake Village, CA 91362

818-991-0200

Ken Norland & Stew Bloom

Evernet Systems, Inc.

5777 West Century Boulevard

Suite 1680

Los Angeles, CA 90045

213-649-5900

Dennis Passavoy & Rick Johnson

Marathon Systems

4 Embarcadero Center

7th Floor, Suite 780

San Francisco, CA 94111

415-362-0500

Doug Vaughan

Massachusetts

Corporate Software

275 Dan Road

Canton, MA 02021

617-821-4500

Kevin Brown

Synetics

540 Edgewater Drive

Wakefield, MA 01880

617-245-9090

Ron Beck

Quality Decision Management (QDM)

200 Sutton Street, Suite 225

North Andover, MA 01845

508-688-8266

Andrew Jeffrey

SandPoint Corporation

124 Mt. Auburn Street

Cambridge, MA 02138

617-868-4442

Mike Kinkead

Minnesota

Connect Computer

9855 West 78th Street, Suite 270

Eden Prairie, MN 55344

612-944-0181

Mike Thomas

New Hampshire

Valinor

7 Perimeter Road

Manchester, NH 03103

603-668-1776

Paul Guaraldi

New Jersey

VASCONDOR

24 Whitewood Drive

Morris Plains, NJ 07950

201-993-8786

Jose Uribe

New York

LAN Systems

300 Park Avenue South

15th Floor

New York, NY 10010

212-995-7700

Gary Hawkins

Ohio

CompuServe Systems Integration

5000 Arlington Center Boulevard

Columbus, OH 43220

614-457-8600

Charles Turner

iLAN

640 A Lakeview Place

Columbus, OH 43085

614-436-7651

Stuart Skomra

Pennsylvania

Monterey Waldec
109 Gamma Center
Pittsburgh, PA 15238
412-963-0505

Tim Wallace

Texas

Data Aids, Inc.
1110 N. Post Oak Road, Suite 220
Houston, TX 77055
713-956-7200

Jack Martin

RE/AIMS
5956 Sherry Lane
Suite 600
Dallas, TX 75225
214-368-7400

John McCrocklin

Virginia

IPC Technologies
7200 Glen Forest Drive
Richmond, VA 23226
804-285-8797

Jeff Andrews

Simpact
12007 Sunrise Valley Drive
Reston, VA 22091
703-758-0190

Gary Levine

Washington

SQL Soft
10635 NE 38th Place Bldg. 24, B
Kirkland, WA 98033
206-822-1287

James O'Farrell

Canada

Group LGS Inc.
2700 Laurier Blvd., Suite 400
Sainte-Foy, Quebec G1V 4KF
418 653 6574

Michel Desaults

Rockwood Informatics
155 Queen St., 9th Floor
Ottawa, Ontario K1P 6L1
613 786 3109

David Niles

Worldwide

Discom
EDS

Northern Europe

P&P
Computacentre
ISL
CINET
IOS
Cislán
Softmatic

Central Europe

Pavosoft
Ergosoft
EDV
Externa
Systor
Notes Dev AG
Computerland
Logon
DAT
ACC
Micado
CompuNet
Net Consult

Southern Europe

Informatica Tre
TC Sistema
CDM
Apsylog
Prosys
Teleinformatica
MicroBlanc
Corporate Software

Australia

Ferntree
Pollak
Microhelp

Each of the VARs listed on these pages have been trained and certified by Lotus Development Corporation. Call the one nearest you for more information. They're ready to help you take advantage of a new and better way to work together. Outside North America, please call or fax Lotus Notes International Marketing: Telephone: INT+(44) 784 455445 Fax: INT+(44) 784 469344.

Lotus Notes Certified VARs



(If you're interested in becoming a Notes certified VAR in North America, please call 1-800-343-5414, Dept. 6409.)

BUYERS' SCORECARD

Banyan's Vines tops ratings based on key features



LAN operating systems

Product scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 50 users per product

| Product | Highest ratings | Lowest ratings |
|--|--|--|
| Banyan's Vines SCORE 78 | Naming service WAN integration features Reliability | Portability to multiple platforms Fault tolerance Support for other PC operating systems |
| Novell's Netware SCORE 72 | Reliability Performance Security features | Service and support Naming service WAN integration |
| DEC's Pathworks SCORE 71 | Host connectivity WAN integration Reliability | Portability to multiple platforms Ease of installation Naming service |
| Microsoft's LAN Manager SCORE 67 | Reliability Host connectivity Transport protocol support | Fault tolerance Service and support Network and systems management |
| IBM's PC LAN SCORE 64 | Host connectivity Reliability Service and support | Portability to multiple platforms Support for other PC operating systems WAN integration |

BY MICHAEL L.
SULLIVAN-TRAINOR
CW STAFF

User expectations of local-area networks run high. They are the applications platform that will increase productivity, reduce cost and make technology more accessible. Much of the weight of these great expectations falls on the LAN operating system, which controls the performance and interaction of applications on the network.

How well do current products meet these complex user demands? Not as well as they could, according to 250 users of LAN operating systems surveyed for *Computerworld's* Buyers' Scorecard. Out of a possible 100 points, users gave their LAN operating system products an average score of 70, suggesting the offerings have a considerable way to go.

However, individual products received high ratings when evaluated on certain features. Banyan Systems, Inc.'s Vines received an overall rating of 78 to top the group on the strength of its naming service, reliability and wide-area network integration.

Novell, Inc.'s Netware placed second overall (72 points), with high marks in performance, application support and fault tolerance.

Digital Equipment Corp.'s Pathworks placed third overall (71 points), with top rankings in service and support and host connectivity.

Microsoft Corp.'s LAN Manager ranked fourth (67 points), with portability to multiple platforms providing its highest ranking.

IBM's PC LAN made the weakest showing (64 points), with two second-place finishes — service and support and host connectivity — and one third-place finish for reliability as its best rankings.

Fifty users were surveyed for each product group. Overall scores were derived by multiplying the ratings each user group gave its own product by the importance factor assigned to the criteria. Scores were then converted to base 100. Each individual criterion was rated based on a 1-to-10 scale, where 10 is very good (see methodology next page).

Banyan's Vines received marks from its users that placed it at the top of nine out of a possible 16 categories and never lower than third place. It scored the highest rating (9) for its naming service.

The product's weakest rankings were in the areas of fault tolerance, service and support, portability and host connectivity.

Netware's user grades placed it last in host connectivity and fourth in a number of categories: naming service, transport protocol support and support for other personal computer operating systems.

DEC's Pathworks had four fourth-place finishes: reliability, application support, ease of installation and portability to multiple platforms.

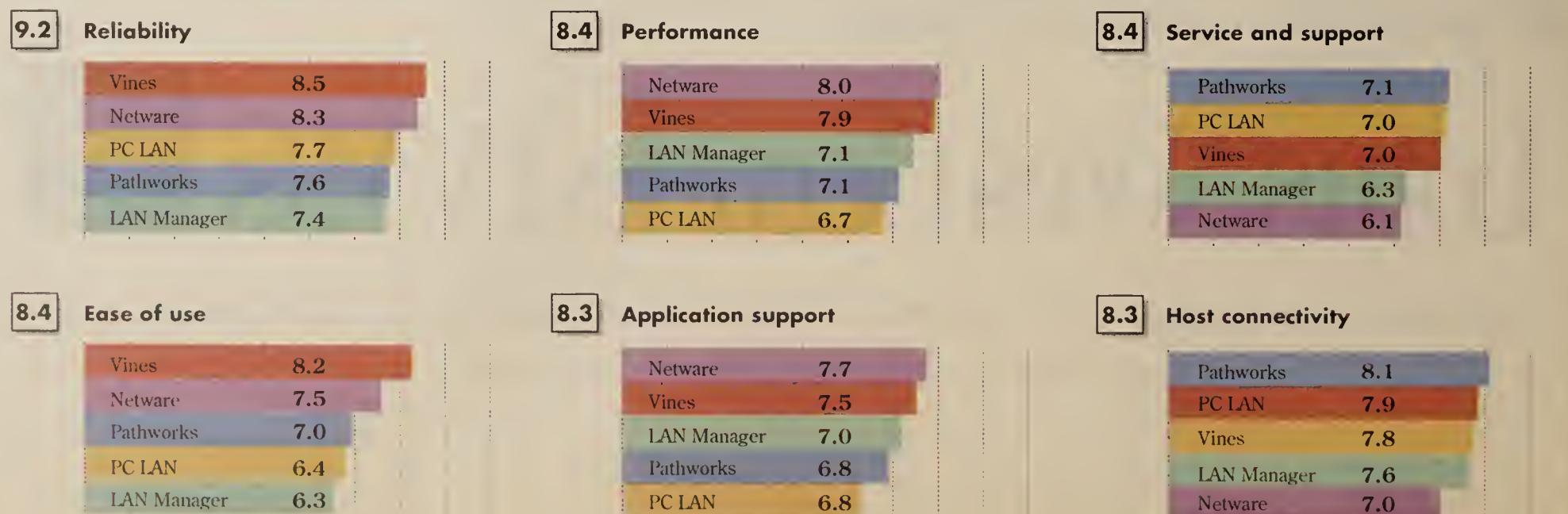
Microsoft's LAN Manager scored very low in service and support (6.3) and finished last in reliability.

IBM's product collected 11 last-place ratings out of 16 categories, including performance, network management and value. The lowest rating of all (4.9) was given to PC LAN for support of other PC operating systems. •

KEY RATINGS

Banyan's Vines edges ahead of Novell's Netware to receive the highest ratings for reliability and ease of use by solid margins. While Netware achieves the highest ratings for performance and application support, DEC's Pathworks ranks highest in service and support and host connectivity.

User importance rating:



A CLOSER LOOK

Banyan's Vines achieves the highest ratings in seven of the remaining categories, falling to third place behind Netware in fault tolerance and third in one other category. Netware ranks third in management, second in value and third in WAN integration. IBM's PC LAN ranks last in all but one category.

8.1 Network and systems management

| | |
|-------------|-----|
| Vines | 8.0 |
| Pathworks | 7.0 |
| Netware | 6.8 |
| LAN Manager | 6.7 |
| PC LAN | 5.6 |

8.1 Value for the dollar

| | |
|-------------|-----|
| Vines | 8.0 |
| Netware | 7.3 |
| Pathworks | 7.1 |
| LAN Manager | 6.3 |
| PC LAN | 6.3 |

7.9 Security features

| | |
|-------------|-----|
| Vines | 8.0 |
| Netware | 7.8 |
| Pathworks | 7.7 |
| LAN Manager | 6.2 |
| PC LAN | 5.9 |

7.6 Fault tolerance

| | |
|-------------|-----|
| Netware | 7.7 |
| Pathworks | 6.9 |
| Vines | 6.8 |
| PC LAN | 6.3 |
| LAN Manager | 5.9 |

7.4 WAN integration

| | |
|-------------|-----|
| Vines | 8.6 |
| Pathworks | 7.8 |
| Netware | 6.3 |
| LAN Manager | 6.2 |
| PC LAN | 5.9 |

7.3 Ease of installation

| | |
|-------------|-----|
| Vines | 7.7 |
| LAN Manager | 6.7 |
| Netware | 6.8 |
| Pathworks | 6.3 |
| PC LAN | 6.0 |

7.2 Transport protocol support

| | |
|-------------|-----|
| Pathworks | 7.3 |
| Vines | 7.3 |
| LAN Manager | 7.1 |
| Netware | 6.9 |
| PC LAN | 6.2 |

7.2 Naming service

| | |
|-------------|-----|
| Vines | 9.0 |
| LAN Manager | 6.4 |
| Pathworks | 6.3 |
| Netware | 6.2 |
| PC LAN | 6.2 |

6.7 Portability to multiple platforms

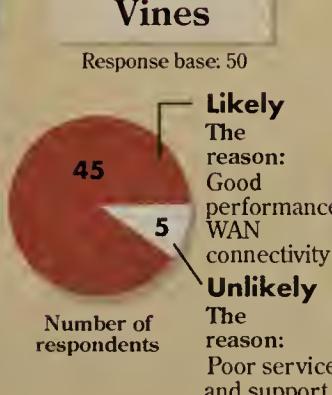
| | |
|-------------|-----|
| LAN Manager | 6.9 |
| Netware | 6.7 |
| Vines | 6.6 |
| Pathworks | 5.8 |
| PC LAN | 5.1 |

6.6 Support for other PC operating systems

| | |
|-------------|-----|
| Vines | 6.8 |
| Pathworks | 6.5 |
| LAN Manager | 6.3 |
| Netware | 6.2 |
| PC LAN | 4.9 |

Loyalties

Would you buy the product again?
(Reasons are based on most frequently stated responses)



Vines

Response base: 50

Netware

Response base: 50

Pathworks

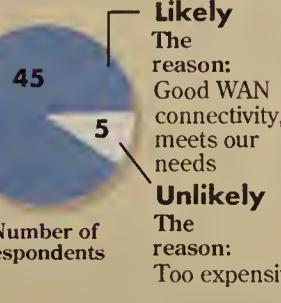
Response base: 50

LAN Manager

Response base: 50

PC LAN

Response base: 50



Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer)

| Likes |
|---------------------------------|
| Interconnectivity |
| Naming system service |
| Ease of use |
| Dislikes |
| Poor end-user support |
| Poor connectivity |
| Not many applications available |

Vines

Interconnectivity
Naming system service
Ease of usePoor end-user support
Poor connectivity
Not many applications available

Netware

Reliability
Widely used product
InterconnectivityPoor end-user support
Complex/Difficult to use
Poor naming service

Pathworks

Interconnectivity
Ease of use
Variety of applications availablePoor end-user support
Difficult and long installation
Poor connectivity

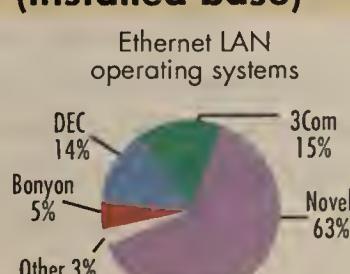
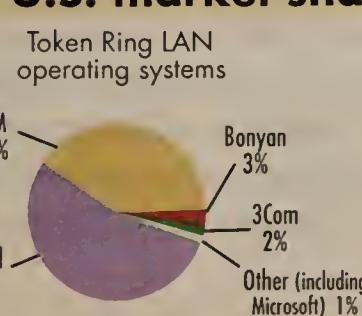
LAN Manager

Interconnectivity
Ease of use
SecurityNot used broadly enough
Poor end-user support
Difficult and long installation

PC LAN

Interconnectivity
IBM compatibility
ReliabilityPoor security features
Too much management overhead
Flaws in memory management

U.S. market share (installed base)



METHODOLOGY

Products that were rated in *Computerworld's* Buyers' Scorecard on local-area network operating systems were selected based on the market share of the vendors in terms of installed base and market value. 3Com Corp.'s product was eliminated because the vendor is no longer pursuing the LAN operating system market.

The minimum number of respondents for each product group was 50. The survey was conducted by First Market Research in Austin, Texas, using a random sample of user names.

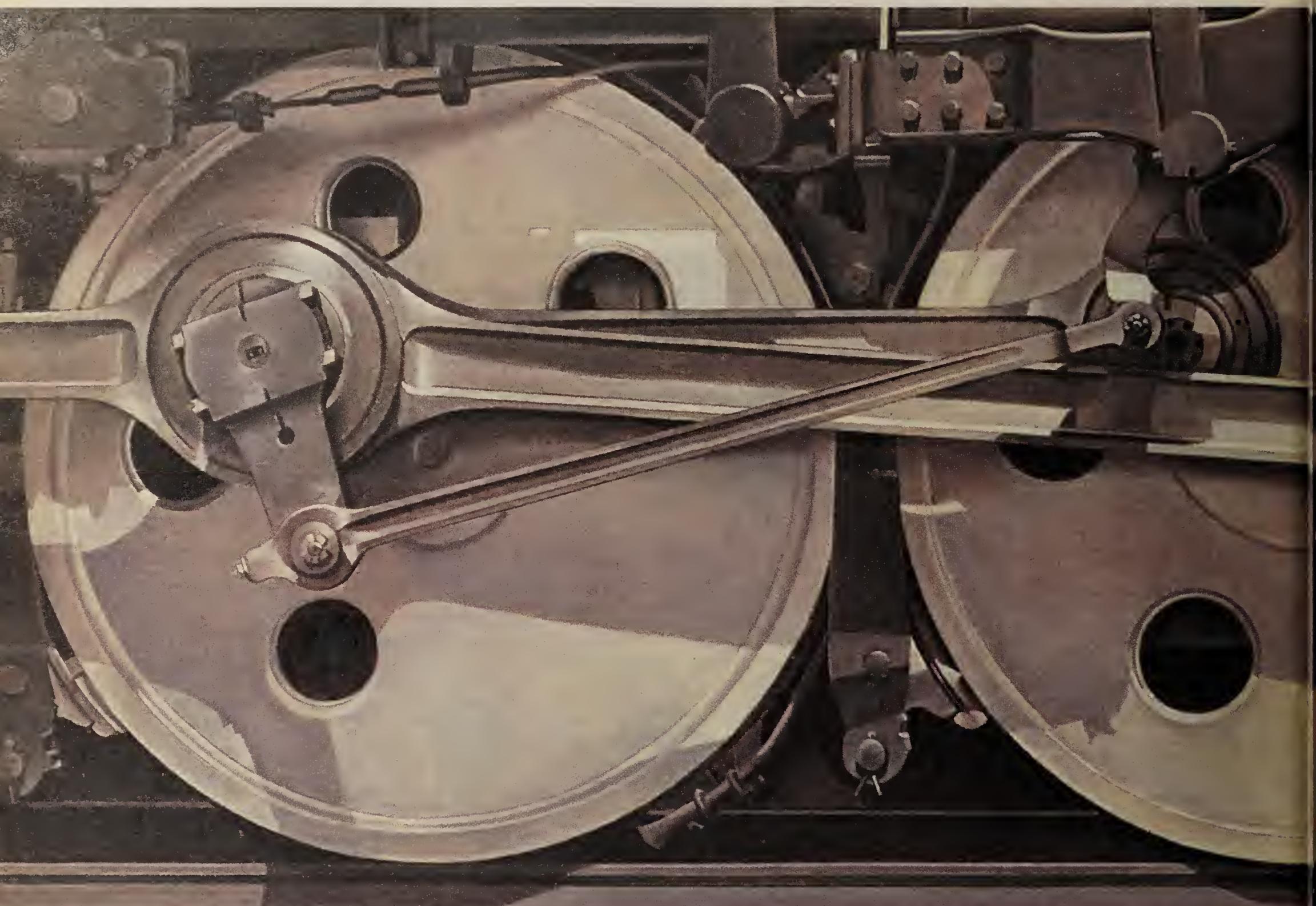
The 250 users surveyed said they would like

to see the following functions added to their products: better integration with other environments (26%), better management tools (17%) and better service and support (7%).

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and organizations for the assistance they provided in preparing this Buyers' Scorecard: Computer Intelligence/Infocorp; Frank Michnoft, program director, desktop computing strategies, Meta Group, Inc.; Janet Hyland, director of network strategy service, Forrester Research, Inc.

Systems integration.



The machinery is complicated.

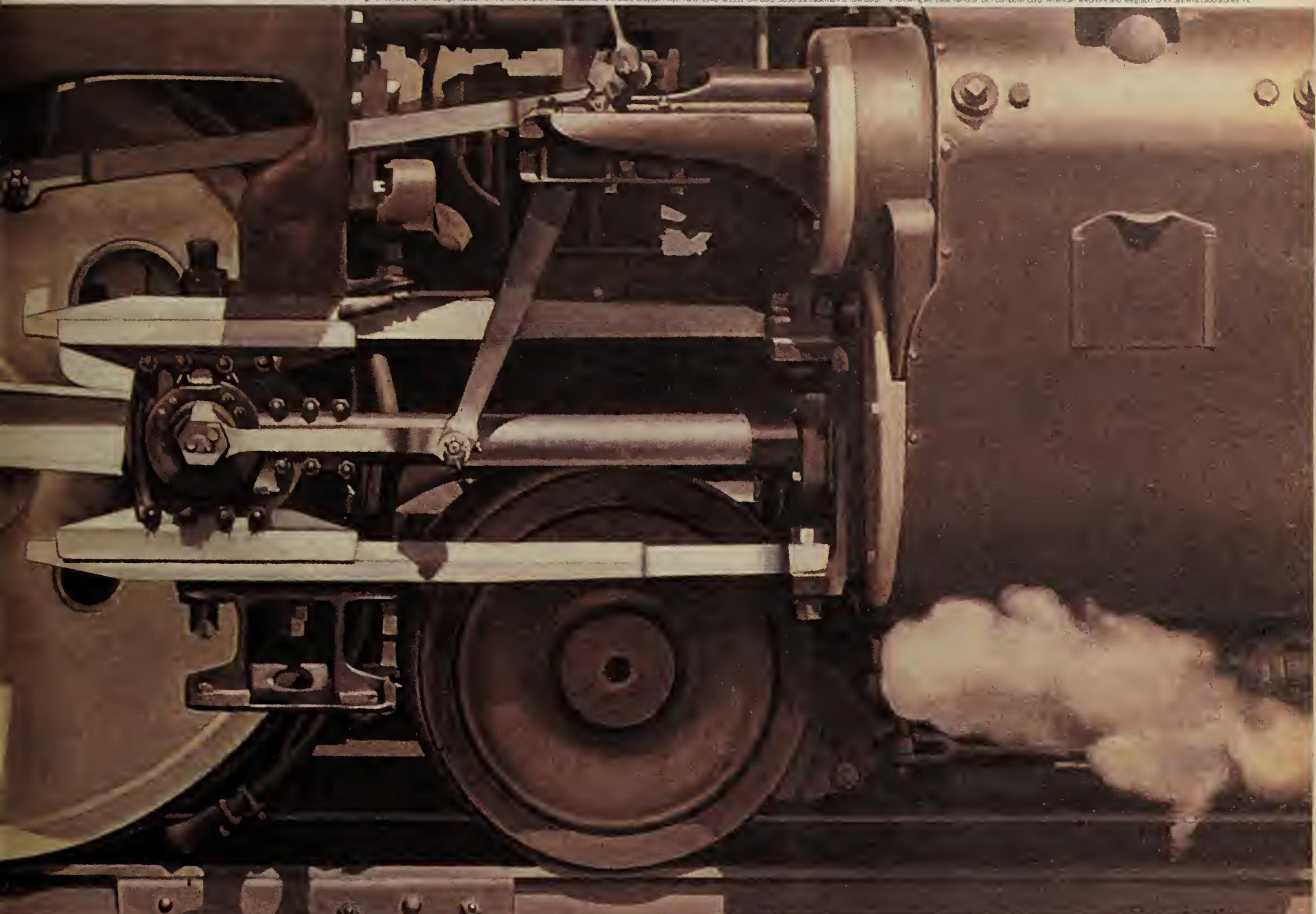
Keeping a business on track is tough enough without having to engineer your systems yourself, especially these days.

Today's solutions are more complex, and more is expected of them. Beyond helpful, they're now "mission critical." And your choices—for vendors, operating systems, protocols and applications—have grown beyond counting.

It's enough to make rational people scream for help, which is exactly what they're doing, calling systems integrators to build new solutions and upgrade existing ones. But how do you choose a systems integrator?

We'd say the first things to look for are experi-

Charles Sheeler, Rolling Power, 1939, Smith College Museum of Art, Northampton, Massachusetts. Purchased, Drayton Hillyer Fund, 1940. ©1991 IBM Corp. 3090 is a trademark of IBM Corp. The following are trademarks of Dell Computer Corp., American Telephone and Telegraph, UNIX Systems Laboratories, Inc.



d, but the passenger shouldn't have to worry about it.

ence and depth. Find someone who's solved your kind of problem before, for your kind of business. Someone whose knowledge of systems and software, networks and network management, from PCs to mainframes, is total.

Someone like IBM.

You'll also need someone who can manage big projects, hire the right subcontractors, train your people and steer you toward future technologies.

Again, someone like us.

Of course, you'll want a company who can be objective about the products they recommend, and it may surprise you, but around 40% of a typical IBM project goes to non-IBM sources.

In fact, we recently automated 625 stores for Zales Jewelers, integrating Dell® PCs running AT&T® UNIX® applications, all connected to an IBM 3090™ host.

We've also integrated 660 locations for the Pennsylvania Liquor Control Board, from cash registers to network management and training, and we finished the job ahead of schedule and under budget.

Which, we hope, shouldn't surprise you. We've been a leading systems integrator for over three decades and, as we've said, experience pays off. For us, for you.

To learn more, see an IBM marketing rep. Or to have one call you, call us at 1 800 IBM-6676, ext. 793. 

DOS and OS/2 LAN operating systems

| VENDOR | PRODUCT | HARDWARE PLATFORM (SERVER/WORKSTATION) | OPERATING SYSTEM (SERVER/WORKSTATION) | MEMORY REQUIRED IN BYTES (SERVER/WORKSTATION) | DISK SPACE REQUIRED IN BYTES (SERVER/WORKSTATION) | NETWORK ADAPTERS SUPPORTED | PROVIDES SUPPORT FOR MACINTOSH CLIENTS | PROVIDES SUPPORT FOR SNA | MAXIMUM NUMBER OF SIMULTANEOUS USERS ON A SINGLE SERVER | MAXIMUM NUMBER OF SHARED PRINTERS PER SERVER | SUPPORTS REMOTE SERVERS | APPLICATIONS SUPPORTED | NAMING SERVICE | PERFORMANCE MONITORING CAPABILITIES | PRICE |
|--|--------------------------------|---|---|---|--|---|---|--------------------------|---|---|-------------------------|--|----------------|--|---|
| Accton Technology Corp. (510) 226-9800 | LAN Soft | Intel 8088-, 80286-, 80386-, I486-based systems (server and workstation) | DOS Version 3.1 or later (server and workstation) | 32K high memory, 4K resident, dedicated and nondedicated/38K | Less than 1M (server and workstation) | Arcnet, Ethernet, Token Ring | No | No | 64 | 5 | No | E-mail, groupware, database, all DOS-compatible applications | Yes | Shows average time needed to service requests made to server, number of files open at one time, optional monitoring program | \$299 (four users), \$499 (eight users), \$699 (32 users), \$899 (64 users) |
| Alloy Computer Products, Inc. (508) 481-8500 | 386/Multi-ware Version 2.03 | 80386-, I486-based systems/Emulation terminals | DOS (server and workstation) | 2M nondedicated/None | 40M/None | Alloy's IMP8, IMP2 boards | Yes | Yes | 21 | 20 | No | E-mail, groupware, database | Yes | Shows average time needed to service requests made to server, number of files open at one time | \$595 (five users), \$995 (10 users), \$5,375 (21 users) |
| Artisoft, Inc. (602) 293-6363 | Lantastic NOS Version 4.0 | IBM PCs and compatibles, MCA compatibles using Netbios-compatible network adapters (server and workstation) | DOS 3.1 or later (server and workstation) | 50K using any Artisoft Ethernet adapter, nondedicated/27K using any Artisoft Ethernet adapter | 360K (server and workstation) | Arcnet, Ethernet, Lantastic, Token Ring | Yes | No | 300 | 5 | Yes | E-mail, groupware, database | NP | Displays cache statistics, shows average time needed to service requests made to server and number of files open at one time | \$1,596 with Artisoft AE-2 Ethernet adapters (five users), \$3,091 with Artisoft AE-2 Ethernet adapters (10 users), \$30,001 with Artisoft AE-2 Ethernet adapters (100 users) |
| AT&T/NCR Corp. (800) 225-5627 | Stargroup LAN Manager 2.0 | NCR System 3000, AT&T WGS Starserver series/ IBM PCs and compatibles, NCR System 3000, AT&T WGS | Unix SVR4/DOS 3.0 or later, OS/2 Version 1.2 to 1.3 | 8M dedicated and nondedicated/512M (basic DOS), 640K (enhanced DOS), 5M (OS/2) | 6.75M/1.2M (basic DOS), 3M (enhanced DOS), 3M (OS/2) | Ethernet, Token Ring | Yes | Yes | Unlimited depending on protocol | 40 | Yes | E-mail, groupware, database | No | Displays cache statistics, shows number of files open at one time | \$1,495 (10 users), \$3,295 (25 users), \$5,295 (75 users), \$7,495 (unlimited users) |
| Banyan Systems, Inc. (508) 898-1000 | Vines Unlimited Version 5.0 | 80386-, I486-based systems/8088-through I486-based systems, Macintoshes | Vines Version 5.0/OS/2 SE, EE, DOS 3.0 or later, Macintosh 6.07 or later | 8M dedicated/88K | 80M/None | Over 100 adapters, including Arcnet, Ethernet, Token Ring, Lanstar | Yes | Yes | Unlimited | 720 | Yes | E-mail, groupware, database, file and print | Yes | Displays cache statistics, shows average time needed to service requests made to server, number of files open at one time, SNMP, operating system and communications statistics, route tracing | \$7,495 (unlimited users) |
| CBIS, Inc. (404) 446-1332 | Network-OS Plus Version 7.2 C | IBM PCs and compatibles (server and workstation) | DOS 3.1 (server and workstation) | 56K dedicated and nondedicated/31K | 1.4M/360K | Arcnet, Ethernet, Lantastic, Token Ring, FDDI, most 100% Netbios-compatible network interface cards | No | Yes | 254 | 5 | No | E-mail, advanced printer access and queue functions, modem sharing, extended/expanded disk caching | No | Displays cache statistics, shows number of files open at one time | \$950 (five users), \$1,988 (eight to 80 users), \$2,587 (255 users) |
| Citrix Systems, Inc. (305) 755-0559 | Citrix Multi-user | 80386-, 80386SX-, I486-based systems and compatibles/PC scan code terminals, IBM PCs and compatibles | DOS, OS/2 (server and workstation) | 4M dedicated and nondedicated/640K | 10M/Less than 1M | Ethernet, Token Ring | No | Yes | Application-dependent | Unlimited serial off the host | Yes | E-mail, groupware, database | Yes | Shows number of files open at one time, CPU use, number of processes in use, amount of memory used, number of users and time in use | \$995 (five users), \$1,490 (10 users), \$2,990 (100 users) |
| Datapoint Corp. (512) 593-7910 | Datalan XA | Datapoint's 7750, 7960, IBM PC/AT, XT/Any PC on Datapoint terminal | MS-DOS, OS/2, Datapoint's Research Management System (server and workstation) | 70K nondedicated/48K | Application-dependent (server and workstation) | Arcnet, Ethernet, Token Ring | Yes | Yes | Application-dependent | Unlimited | Yes | E-mail, database | Yes | Displays cache statistics, shows number of files open at one time | \$795 (up to 225 users) |
| Digital Equipment Corp. (508) 493-5111 (800) 344-4825 | Pathworks for OS/2 Version 2.0 | Decstation 333, DEC PC 433T, Intel platforms/Decstation 316SX, 320SX, 325C, 333C, 425C, DEC PC 433W | OS/2/DOS, OS/2 SE, OS/2 EE | 6M dedicated/4M | 8M (server and workstation) | Ethernet, Token Ring | No | No | 128 | Dependent on hardware configuration | Yes | E-mail, database | No | None | \$195 per client license |
| D-Link Systems, Inc. (714) 455-1688 | Lansmart NOS 3.0 | IBM PCs and compatibles (server and workstation) | MS-DOS 3.1 or later, DR DOS 5.0 or later (server and workstation) | 512K (server and workstation) | 720K (server and workstation) | Arcnet, Ethernet, Token Ring, D-Link Pocket LAN adapters | No | No | 1,024 | 5 | Yes | E-mail, groupware, database | Yes | None | \$395 (software network license) |
| Gateway Communications, Inc. (714) 553-1555 (800) 367-6555 | Great OS | IBM PCs and compatibles (server and workstation) | DOS (server and workstation) | Less than 65K (server and workstation) | 720K (server and workstation) | G/Ethernet, G/Ethertwist | No | Yes | 15 | Unlimited | Yes | E-mail, groupware, database | Yes | Monitors, transmits and receives statistics; transmits and receives error information, data compression statistics, packet statistics | \$495 (five users), \$795 (10 users), \$6,765 (six 15-user kits plus one 10-user kit) |
| Grapevine LAN Products, Inc. (206) 869-2707 | GV LAN/OS Version 2.0 | IBM PCs and compatibles (server and workstation) | MS-DOS (server and workstation) | 62K dedicated and nondedicated/62K | 360K (server and workstation) | Arcnet, Ethernet, serial | No | No | 50 | 5 | Yes | E-mail, groupware, database | Yes | None | \$695 (five users), \$1,095 (10 users), \$1,095 (100 users) |
| Hayes Microcomputer Products, Inc. (404) 441-1617 | Lanstep Version 1.0 | 80286-based systems or later/8088-based system or later | DOS, Windows 3.0, Lanstep (server and workstation) | 1.5M extended dedicated, nondedicated/640K base memory | 20M/Not required | Arcnet, Ethernet, Token Ring, any NDIS-compatible adapter | No | No | 128 | 3 | No | E-mail, database, any Netbios-compatible | Yes | Displays cache statistics, NDIS reported network adapter statistics | \$595 (five users), \$990 (10 users), \$3,570 (100 users) |
| IBM (800) 426-2468 | OS/2 LAN Server Version 2.0 | Any 80386-through 1486-based systems/Any 80386-through 1486-based systems, DOS compatibles | OS/2 1.3, OS/2 2.0/OS/2 1.3, 2.0, DOS 3.3, 4.01, 5.0, Windows 3.0 | 5M dedicated, nondedicated/2.1M with OS/2 1.3, 2.0, 105K with DOS 5.0 | 17M/13M | Ethernet, Token Ring, IBM PC Network | Yes | Yes | 1,016 | 6 | Yes | E-mail, groupware, database | Yes | Shows average time needed to service requests made to server, number of files open at one time | \$1,170 (five users), \$1,545 (10 users), \$8,295 (100 users) |
| Invisible Software, Inc. (415) 570-5967 | Net30 Version 3.0 | DOS, Windows, IBM PCs and compatibles (server and workstation) | DOS, Windows (server and workstation) | 85K nondedicated/60K | 512K + (server and workstation) | Ethernet | No | No | 99 | 2 | Yes | E-mail, groupware, database | Yes | Displays cache statistics, shows number of files open at one time, disk activity, record locks, number of users | \$199 at low end includes twisted-pair, 1.8-M-bit adapter; \$349 at high end includes Ethernet adapter |
| Lanmark Distributing Corp. (416) 848-6865 | Easynet NOS/2 Plus Version 3.0 | IBM PCs and compatibles, any 80386-, I486-based system (server and workstation) | DOS 3.0 or later (server and workstation) | 35K dedicated, 50K nondedicated/20K | 1M/500K | Arcnet, Ethernet, Lantastic, Token Ring, any Netbios-compatible adapters | Yes | No | 255 | 5 | Yes | E-mail, groupware, database, all Netbios-compatible | Yes | Monitors all network activity at any station on the network, checks network hardware before loading network | \$295 (five users), \$494 (10 users), \$695 (32 users), \$995 (100 users) |

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

Nightmare Scenario #1

THE UNDETECTED TIME BOMB.

The biggest networking disasters always start small.

The problems tend to begin when you need to grow.

Suddenly, the computer network that worked so well doesn't seem to work at all.

You have to hire more network administrators. Spend more money. Retrain. Reconfigure.

And every time you grow, even a little bit, your network gets harder to manage, harder to use, and harder to fund.

Switching over to VINES isn't just smart, it's easy.

It's a question of architecture. A network like Novell's NetWare® is not an integrated system. Adding new users of services means having to update user profiles, retrain employees, and troubleshoot connectivity problems.

Banyan's architecture is designed to grow effortlessly. (Ease of growth is why we're the leader in true enterprise-wide pc networking.)

Whether you're growing

from 10 users to 100 or even 10,000, your Banyan VINES® architecture stays the same.

Even if your network grows to span continents, the cost of managing the network will be kept to a minimum.

VINES can save you a fortune. That's indisputable.

What's more, VINES' open, standards-based architecture lets you adopt whatever new products come along—whether it's one of today's powerful new "super servers" or some of the thousands of network-based applications available for VINES.

Whatever your specific requirements—Global Naming, Security, WAN interconnection, Global Administration, Multi-processing, or Multilingual capability—Banyan can deliver immediately. Now.

Easy, economical growth must be planned in. It can't be tacked on.

You don't have to scrap the network you have now in order to switch to VINES. We can make your transition simple and inexpensive.

Get the facts. We've prepared a booklet, "THINGS

THEY DON'T TELL YOU AT NOVELL PRESENTATIONS." You'll find it a useful source of comparative information.

More than a million people now use Banyan VINES, in operations ranging from a handful of users to the world's largest pc-based global networks.

The more you know, the more you will want Banyan. We can simplify the use and management of your distributed network.

Call 1-800-828-2404 for a free brochure.

Please send this coupon to: BANYAN, 120 Flanders Road, Westboro, MA 01581
1-800-828-2404

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____



BANYAN®

Networking. Without Limits.™

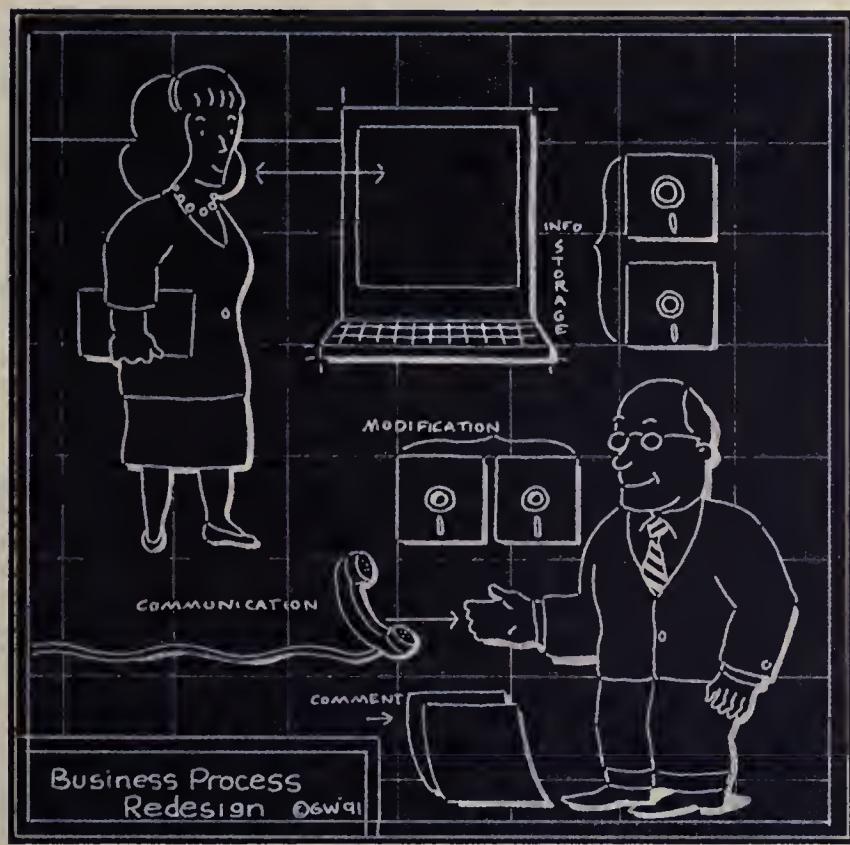
LAN OPERATING SYSTEMS AND APPLICATIONS

PRODUCT SPOTLIGHT

| VENDOR | PRODUCT | HARDWARE PLATFORM (SERVER/WORKSTATION) | OPERATING SYSTEM (SERVER/WORKSTATION) | MEMORY REQUIRED IN BYTES (SERVER/WORKSTATION) | DISK SPACE REQUIRED IN BYTES (SERVER/WORKSTATION) | NETWORK ADAPTERS SUPPORTED | PROVIDES SUPPORT FOR MACINTOSH CLIENTS | PROVIDES SUPPORT FOR SNA | MAXIMUM NUMBER OF SIMULTANEOUS USERS ON A SINGLE SERVER | MAXIMUM NUMBER OF SHARED PRINTERS PER SERVER | SUPPORTS REMOTE SERVERS | APPLICATIONS SUPPORTED | NAMING SERVICE | PERFORMANCE MONITORING CAPABILITIES | PRICE |
|--|--------------------------|---|--|--|--|---|---|--------------------------|---|---|-------------------------|--|----------------|--|---|
| Mainlan, Inc. (407) 331-4400 (800) 999-6770 | Mainlan for Windows | IBM PCs and compatibles (server and workstation) | DOS 3.1 or later (server and workstation) | 55K nondedicated/30K | Less than 360K (server and workstation) | Arcnet, Ethernet, Lantastic, Mainlan, Mainlan Ethernet, any Ethernet board with Netbios driver | No | No | 20 | One per server | No | E-mail, Groupware, database, any network application that supports Netbios | No | None | \$299.95 (64 users) |
| Microsoft Corp. (206) 882-8080 | LAN Manager Version 2.1 | 80286-based systems or later/8088-based systems or later, Macintosh | OS/2/Macintosh, Windows, DOS, OS/2 | 5M dedicated and nondedicated/640K | 6M/1M | Arcnet, Ethernet, Token Ring, FDDI, any NDIS supported | Yes | Yes | 1,016 | 100 | Yes | E-mail, groupware, database, any Netbios or OS/2 application | No | Displays cache statistics, shows average time needed to service requests made to server, shows number of files opened up at any one time | \$1,995 server software (10 users), \$3,495 server software (unlimited users) |
| Moses Computers, Inc. (408) 358-1550 | Promiselan | IBM PCs and compatibles (server and workstation) | DOS (server and workstation) | 16K dedicated, non-dedicated, 26K peer/10K | 16K/10K | Proprietary hardware via RJ 11 | No | No | 255 | 7 | Yes | E-mail, groupware, database | Yes | Shows number of files open at one time and number of sessions | \$99 per workstation |
| | Chosenlan | IBM PCs and compatibles (server and workstation) | DOS (server and workstation) | 16K dedicated, non-dedicated, 26K peer/10K | 16K/10K | Proprietary hardware via RJ 11 | No | No | 255 | 7 | Yes | E-mail, groupware, database | Yes | Shows number of files open at one time and number of sessions | \$139 per workstation |
| Net-Source, Inc. (408) 246-6679 | Silvernet 2.0 | 8088-through I486-based systems (server and workstation) | DOS 3.30 through 5.0 (server and workstation) | 3K nondedicated/1K | 300K (server and workstation) | Arcnet, Ethernet, Token Ring, any Netbios | No | Yes | 254 | 3 | Yes | E-mail | No | Displays cache statistics, shows number of files open at one time, connected users, audit trailing | \$499 (five users), \$799 (12 users), \$2,299 (254 users) |
| Novell, Inc. (800) 638-9273 | Netware Version 3.11 | 80386-based systems or later/IBM PCs and compatibles | Netware Version 3.11/DOS 2.0 or later, OS/2 1.0 through 2.0, Macintosh system/finder, Unix | 4M/56K (23K with expanded/extended memory) | 9M/89K | Arcnet, Ethernet, Token Ring, FDDI | Yes | Yes | 250 | 16 | Yes | E-mail, groupware, database | Yes | Displays cache statistics, shows number of files open at one time | \$2,495 (10 users), \$6,995 (100 users), \$12,495 (250 users) |
| | Netware Lite Version 1.0 | 8086-, 80286-, 80386-based systems (server and workstation) | Netware Lite Version 1.0/DOS 3.0 or later | 70K dedicated, 85K nondedicated/25K | 600K/300K | Arcnet, Ethernet, Token Ring, most popular LAN cards supported | No | No | 25 | 3 | No | E-mail, groupware, database | Yes | Displays cache statistics, shows number of files open at one time | \$99 per user |
| | Netware Version 2.2 | 80286-, 80386-, I486-based systems/IBM PCs and compatibles, Macintosh Version 6.0 | Netware Version 2.2/DOS 1.0 or later, OS/2 1.0 through 2.0, Macintosh system/finder | 2.5M dedicated and nondedicated/64K | 10K/64K | Arcnet, Ethernet, Token Ring, most popular LAN cards supported | Yes | Yes | 100 | 10 | Yes | E-mail, groupware, database, most Macintosh applications supported | Yes | Shows average time needed to service requests made to server, number of files open at one time | \$895 (five users), \$1,995 (10 users), \$3,495 (50 users), \$5,495 (100 users) |
| Performance Technology, Inc. (512) 349-2000 (800) 327-8526 | Powerlan | IBM PCs and compatibles (server and workstation) | MS-DOS (server and workstation) | 2M dedicated, 27K nondedicated/14K | 2M/360K | Arcnet, Ethernet, Token Ring, FDDI, any Netbios | No | No | 250 | Unlimited | Yes | E-mail, groupware, database | Yes | Displays cache statistics, shows number of files open at one time | \$795 (five users), \$995 (10 users), \$3,195 (unlimited users) |
| Sitka Corp. (510) 769-9669 | DOSTOPS 3.0 | IBM PCs and compatibles (server and workstation) | MS-DOS (server and workstation) | 66K conventional, 237K extended nondedicated/86K conventional, 266K extended | 1M (server and workstation) | Ethernet, Localtalk | Yes | No | 20 | 3 | Yes | E-mail, groupware, database | No | None | \$249 per user |
| The Software Link, Inc. (404) 448-5465 (800) 766-5465 | PC-MOS 4.10 PL/5 | 8086/88-, 80286-, 80386-, I486-based systems/Terminals, nonterminal products | PC-DOS/NA | 1M/32K | 1,080K/NA | Arcnet Ethernet, Token Ring | No | No | 25 | 3 | Yes | E-mail, groupware, database, DOS-compatible | Yes | Shows number of files open at one time, available drives, available printers, I/O port speed, I/O count, retries, open file control blocks, open handles, each function being executed | \$195 (single user), \$595 (five users), \$795 (nine users), \$995 (25 users) |
| | Lanlink 5X Version 2.10 | 8086/88, 80286, 80386, I486-based systems (server and workstation) | PC/MS-DOS, PC/MS-DOS with Multilink, PC-MOS/PC/MS-DOS, PC-MOS | 32K nondedicated/32K | 40M plus operating system/53M plus operation system | None | No | No | 16 | 3 | Yes | E-mail, groupware, database, any DOS application | NA | Shows number of files open at one time, available drives and printers, I/O port speed and count, retrieves, open file control blocks, open handles, each function being executed | \$695 (five users, PC-MOS), \$745 (five users, Multilink), \$1,195 (10 users, PC-MOS), \$1,245 (Multilink, 10 users), \$1,795 (16 users, PC-MOS), \$1,845 (16 users, Multilink) |
| Starpath Systems, Inc. (517) 332-1137 | Vmos 1.5 | 80386-based systems, XT/AT bus PC/Advance Micro Research unterminal | Starpath's Vmos/Multiuser (server and workstation) | 2M nondedicated/NA | 1M - 5M/NA | Arcnet, Ethernet, Lantastic, Token Ring | No | Yes | 64 | 40 | No | E-mail, groupware, database, DOS applications | No | Displays cache statistics, real-time performance statistics | \$398 (unlimited users) |
| Tiara Computer Systems, Inc. (415) 965-1700 | 10Net 5.0 | IBM PCs and compatibles (server and workstation) | DOS 3.1 or later, Windows 3.0 or later, DR DOS (server and workstation) | 84K nondedicated/53K | 1M/1M | Arcnet, Ethernet, proprietary 1M bit/sec., twisted-pair LAN, any NDIS | No | No | 26 | 26 | Yes | E-mail, groupware, database, DOS, Netbios-compatible applications | Yes | Displays cache statistics, measures amount of information sent and received at server, shows number of files opened up at any one time | \$499 (five users), \$799 (10 users), \$2,499 (100 users) |
| Torus Systems, Inc. (415) 594-9336 | Tapestry II Version 2.0 | Any DOS or OS/2 machine (server and workstation) | DOS, OS/2 (server and workstation) | 3M dedicated/640K | 5M/None | Ethernet, Lantastic, Token Ring, FDDI | No | No | Unlimited | 8 | Yes | E-mail, time management, communications server | Yes | Shows number of files open at one time | \$1,750 (five users), \$3,500 (10 users) |
| Trans-M Corp. (508) 359-5144 | Net 127 Version 5.0 | IBM PCs and compatibles (server and workstation) | DOS (server and workstation) | 32K/4K | 241K (server and workstation) | Proprietary | No | No | 255 | 3 | Peer-to-peer | E-mail | No | None | \$129 per station |
| Ungermann-Bass, Inc. (408) 496-0111 | Net/One LAN Manager | IBM PCs and compatibles (server and workstation) | OS/2/OS/2, DOS | 7M - 9M nondedicated/640M - 2M | 10M/None | Ethernet, Token Ring, FDDI | No | No | 1,000 | 32 | Yes | E-mail, database | No | Shows number of files open at one time | \$1,995 (10 users), \$5,995 (100 users) |
| Webcorp (415) 331-1449 | Web 3.0 | IBM PCs and compatibles (server and workstation) | DOS (server and workstation) | 30K dedicated, 50K nondedicated/30K | 410K (server and workstation) | Arcnet, Ethernet, Lantastic 2M bit/sec., Token Ring, FDDI, any hardware with a netware 1PX shell driver | No | Yes | 1,000 plus (limited only by hardware) | 8 | Yes | E-mail, groupware, database, IPX/Netbios-compatible | Yes | Displays cache statistics, shows number of files open at one time | \$494 (five users), \$995 (15 users), \$1,495 (30 users) |

A blueprint for change

Business process redesign can be disruptive without a plan. Here are seven steps to a more effective, competitive company



Garrison Weiland

BY LOUIS FRIED

The faint of heart have no business messing around with business process redesign (BPR). While the goal is inviting — existing or new technology used to revamp business processes and keep companies vital — the substantial changes in work habits and environments have scared off more than a few organizations.

However, the brave few have forged ahead, willing to deal with major change at the outset to strengthen the company in the long run.

Mutual Benefit Life Insurance Co., for one, knew its time-consuming process of issuing a policy was getting in the way of its doing business aggressively. Several months typically elapsed from the time an application was received to when it was issued.

The old process spanned five departments, each involved in a

Fried is vice president of information technology consulting at SRI International in Menlo Park, Calif.

supporting process, 19 specialists and seven different computer systems. So the firm redesigned.

Today, a single "case manager" issues policies, which takes one day. The staff was cut from 225 to 100, and a single computer system supports the new operation.

Gut-wrenching? Most likely. Worth it? Most definitely.

Few precedents

Because the "discipline" of business process redesign is only about two years old, pacesetters such as Mutual Life have had few paths to follow. However, companies today are luckier: They have the experiences of other companies to help them.

Such redesign veterans advise resisting the temptation to simply link existing subprocesses; what results are just islands of improvement. For substantive and fundamental change, these veterans say, firms must take a holistic process view, taking into account the intricate interweaving of processes inside and outside the organization.

What follows is a framework for BPR based on the experiences of pioneering companies and rooted in the need for enhancing a company's competitive position:

STEP

1

Taking the customer's view. A BPR scouting team — a group that will make the preliminary analyses of which particular business process should be redesigned and why — should be established up front. Senior management and senior information systems executives often guide the effort, with outside consultants adding a neutral opinion to the mix. They can help break the company out of any ingrained thinking patterns.

This scouting team conducts the first two steps in the BPR project, which focus on identifying problem processes. Subsequent steps, which focus on diagnosis and solutions, are handled by an expanded team.

The first step in BPR is to take an unbiased look at the company's products and services from an external as well as an internal customer perspective, relating the observations to company processes.

Not only is it important for the team to be clear on the company's strategy, but it must also find out whether this strategy is being effectively applied.

In terms of external customer data, that means getting information on whether products or services are gaining or losing

market share, whether there are common or consistent customer problems, why a competitor's offering is attractive to customers and so on. Companies may have such information available through their market surveys and product satisfaction surveys.

One retail appliance manufacturer, for example, relied on warranty card questionnaires that customers filled out to obtain information about customer buying preferences at time of purchase. The company bolstered this information with an in-depth survey. What it found out was that there were few repeat buyers of products because of service difficulties.

This information led to a redesign of the company's after-sale service function.

For internal customer analysis, the scouting team may use an approach known as transaction analysis to survey the internal customers of specific functional units to determine their perceptions in terms of levels of satisfaction, value received for cost and timeliness of response.

The technique is also useful for prioritizing the needs for those services on the basis of perceived value (or importance) to the customers. When supplemented by interviews, the technique can lead to specific problem definition helpful to the BPR project.

In addition, transaction analysis can aid in identifying the types of information and support provided; the flow of information

Continued on page 94

Business process redesign (BPR) is a methodology for transforming the business processes of an enterprise to achieve breakthroughs in the quality, responsiveness, flexibility and cost to compete more effectively and efficiently in a chosen market. BPR uses a combination of industrial engineering, operations research, management theory, quality management and systems analysis techniques and tools.

In 1970, IDEA Courier introduced its first terminals for IBM mainframes. Today, three technology generations later, our products span the entire SNA spectrum — and break through to the universe beyond.

Our IDEA Concert™ communications processor, for example, not only performs traditional 3174 cluster controller duties perfectly, it also supports multiple hosts (including AS/400s and DEC VAXs), multiple LAN types, gateways and, of course, terminals and printers.

GET THE W

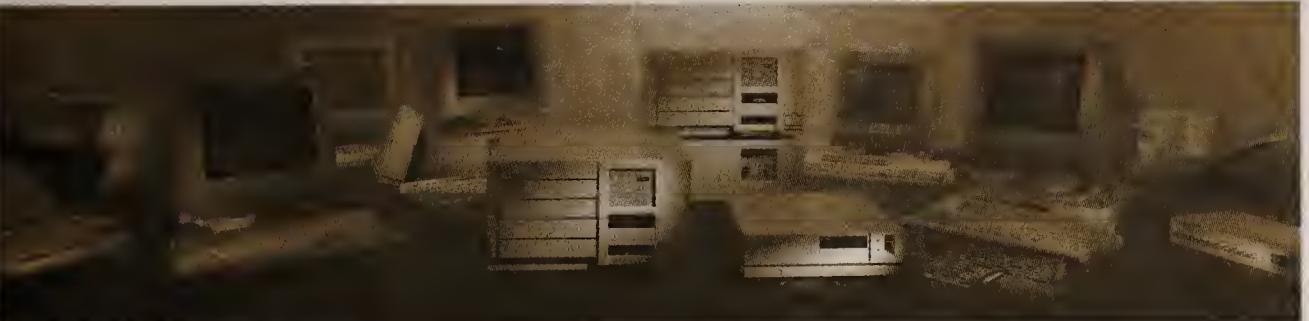
Our Advanced Function Terminals add intelligence to the desktop while cleaning up cluttered application screens quicker than you can say "PC."

As for PCs, our emulation and gateway products — hardware and software, local or remote, for servers and users — show you how far we've come from the old terminal days.



IDEA CONCERT COMMUNICATIONS CONTROLLER ▲ 12000 DISPLAYS

Here's how to get an even better IDEA.



Please Send Me Information About:

- IDEA Concert Controller
- IDEA 12000 Terminals
- Advanced Function Terminals
- IDEA Printers
- Gateways to Mainframes
- IDEAcmm Boards

My Company Has Installed:

- IBM Mainframes
- DEC VAXs
- AS/400 or S/36, S/38

Quantity:

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

IDEA[®]

The intelligence to communicate better.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 6162 PHOENIX, AZ

Postage will be paid by addressee

IDEA Courier
ATTN: Product Marketing/MS A16
P.O. Box 29039
Phoenix, AZ 85038-9039

CW



HOLE IDEA.

Along with our products and technology, IDEA has expanded, too. IDEA Servcom, our service organization, provides first-class, on-site maintenance throughout North America. From IDEAssociates comes the twinax technology to design and manufacture our midrange products. And IDEA International supports cus-

tomers in over 50 countries around the world.

And yes, we still sell terminals. In fact, the first coax terminals in the United

States to meet the most stringent emissions and

ergonomic standards — the MPR-II Swedish Recommendation. Available in 14" and 15" screen sizes. Monochrome. Color. Black and white. Upgradeable, too. All the way up to our Advanced Function Terminals.

Now that you have the whole IDEA, let us help you implement better ideas. Call 1-800-528-1400, ext. 7782.

IDEA®
The intelligence to communicate better.

ADVANCED FUNCTION TERMINALS ▲ GATEWAYS TO MAINFRAMES

IDEAssociates, and IDEA are registered trademarks of IDEAssociates, Inc. Courier and Servcom are registered trademarks of IDEA Courier, Inc. IDEA Concert is a trademark of IDEAssociates, Inc. Other products or trade names are the trademarks or registered trademarks of their respective owners.

Continued from page 91

and support; overlap and interdependence of organization units; and potential redundancy of activities.

A major process industry company recently used transaction analysis to determine the manner by which it could improve technical support to its plants and field operations.

The analysis showed a substantial deviation between the perceptions of the support providers and receivers in terms of the importance of the different services provided and satisfaction with the quantity and quality of those services. What resulted was a long-term program to reorganize and change the processes of providing technical support.

Depending on the depth of analysis required (some companies already know a lot about their process problems), the scouting team may also use a technique called Quality Function Deployment. This technique, developed in Japan, is a matrix method in which product or service functions and features are compared with customer needs.

The matrix shows how important the product's characteristics are for delivering functions and features, which company processes are critical for delivering those component characteristics and what controls are needed for continued delivery of those characteristics with the desired level of quality.

STEP 2 **Taking management's view.** The scouting team must correlate the results of obtaining the customer view with the views of business managers to obtain a consolidated picture of primary threats to the company's competitive position.

When viewed in terms of customer satisfaction, it is usually easy to trace the cause of problems to broad processes within the company. Subsequent detailed analysis may alter conclusions to some extent, but rarely beyond the range of the general process pinpointed initially.

At this point, the scouting team works with high-level business managers to establish which processes are targets for redesign and to set improvement priorities consistent with the overall business strat-

Seven steps to a better designed company

The goal is to get business processes to operate effectively for a company as well as for its customers and suppliers

| Business process redesign | | Technical methods and tools | | | | |
|--|---|-----------------------------|---------------------------------------|--|--------------------------------------|-------------------------|
| | | Transaction analysis | Information and process flow analysis | Structured interviews and observations | Quality function deployment matrices | Performance measurement |
| Planning, analysis and decision-making tasks | 1 Customer view | ✓ | | ✓ | ✓ | |
| | 2 Management view | | | ✓ | ✓ | |
| | 3 Current process definition, measurement | ✓ | ✓ | | | ✓ |
| | 4 Working group | | | ✓ | ✓ | |
| | 5 Change opportunities | ✓ | ✓ | | | ✓ |
| | 6 Analysis of recommended action | ✓ | ✓ | | | ✓ |
| | 7 Approval, commitment, implementation | | | | ✓ | ✓ |

Source: SRI International

CW Chart: Marie Haines

egy. Improvement goals may be stated in terms of quality improvement, productivity, cost, delivery time or other measures desired by management to meet competitive needs.

With a process targeted for potential redesign, the team now shifts its focus to the line manager responsible for that business process. He is charged with appointing members to a steering committee, which includes all the current managers responsible for subprocesses within the business process and the head of the IS function that supports the process.

The steering committee's responsibilities include the following:

- Providing management direction to the BPR project team.
- Ensuring that adequate resources are provided for the BPR project.
- Suggesting and evaluating proposed changes to the business process.
- Making final recommendations to senior management.
- Guiding the implementation of changes and new systems.

The steering committee then establishes a BPR project team made up of a project team leader from the business process, representatives from each orga-

nization currently conducting a part of the business process to be studied, associated IS professionals and, if needed, a consultant. This team will perform detailed analysis, design the changes or new systems and identify any new or modified implementations of information technology to support the modified business process.

The team will be substantially dedicated to the BPR project throughout the analysis and recommendation phase. This team will also form the cadre for guiding the implementation phase in the future.

STEP 3 **Current process definition and measurement.** With customer and management view in hand from the scouting team, the BPR project team defines in detail the existing process and measures process performance in terms consistent with the firm's objectives for process improvement.

If, for example, the BPR goal is to improve the selected process in order to lower costs or improve delivery or response time, then it is important to get a handle on how the current delivery and response processes work.

To perform this analysis, which is

based on industrial engineering techniques, team members must observe process activities and interview employees who perform the steps in the business process.

Typically, a BPR project team member will first interview employees who perform a subprocess and then, from their description, note each step in the process, the documents and data used, the sources of information, the disposition of results, the estimated time required for each step and the interactions with other employees or subprocesses needed to perform the task.

Following the interviews, team members will observe workers performing their tasks to validate what's been said.

This definition phase is critical. It is imperative for the team to understand what added value is produced or not produced in each step.

For example, steps in which documents are filed or retrieved from files normally do not add value to the end product. The team must also understand what information is used or created/modified in each step.

The BPR team can take advantage of information technology tools developed

When it's time to implement your approved plan

Business process redesign projects need care and feeding to be successful

A business process redesign effort doesn't stop when you have a plan in hand. Implementing a redesign project requires great effort. However, you can ease the implementation process by following certain critical success guidelines:

► **Include input from all the appropriate people.** The implementation project for a major business process may take two or more years. While commitment from top management to see the project through is well-known, input from other managers is less so. The cross-functional nature of process redesign may mandate assistance from the head of human resources or personnel to deal with changes that affect employees and/or the head of public relations to cover any external publicity aspects.

Furthermore, the enforcers will need

to maintain coordination with the managers of functions that use the outputs of the redesigned process to ensure that new interfaces operate smoothly.

If the process involves external suppliers or distributors, there will need to be close coordination with them. It may be necessary to set up a help desk or hot line during the implementation phase or to train field representatives to assist such external participants.

► **Analyze and plan.** The success of the implementation will depend on the quality of the analysis and planning performed prior to the project.

► **Keep company staff informed.** You should provide all affected or potentially affected company personnel with regular information about the BPR project purposes, status and effect on existing processes, employees, training schedules and interface needs. If you expect staff

reductions, provide employees with a top management statement at the beginning of the project about how such reductions will be managed. For example, a statement that all staff reduction will be managed through normal attrition can make a major difference in employee cooperation.

► **Ensure continuity and consistency.** Stopping and restarting the project is a recipe for disaster. It demonstrates a lack of commitment. You should discourage midstream changes in the project plan unless they are critical to the end result of the project (for example, a mid-course decision to outsource the function supporting the process) or are caused by changes in the external environment of the business process (for example, a change in the investment capability of the firm).

Expect some minor changes and fine-

tuning during the period right after implementation.

► **Pilot.** Where possible, you should set up and evaluate a pilot operation of the redesigned business process. Debugging is always easier when only a limited part of the company's activities have been committed.

► **Constantly monitor the implementation.** You should measure the results of the process change against the goals established during the analysis phase and periodically report on these results for at least the first few years of the implementation. In fact, it is a good idea to build measurement devices into the new process to provide continuous measurement and form a basis for further evolution. Business processes must be expected to continually evolve as business conditions and the needs of customers change. •

for computer-aided software engineering to document the business process steps. The team uses these process and data description tools to create a graphic annotated flowchart of process steps for later presentation to the steering committee members. Annotations may include quality measures and the elapsed time and labor hours for each step.

To help them determine ways in which the process can be improved, the team should also note whether certain steps must be performed before others, concurrently or in a different sequence. Computer-based project management tools may be used to make this analysis easier.

In Step Three, the BPR process shifts to objective, detailed measures of output that include traditional measures of production time, delivery time, productivity, cost, quality or failure rate, complaint rates and so forth. If a company does not currently have measurement systems in place, it will have to develop and implement them during this phase.

Measuring the outputs of current subprocesses provides a clue to the causes and effects of current problems, identifies specific steps or subprocesses requiring improvement and helps refine the specific improvement goals for the selected business process.

STEP 4

Working group education. By this time, the BPR team will have a fairly good idea which information technology will play a significant role in enabling changes to the business process. Knowledge about that technology must be shared so that those involved will be able to participate properly in planning business process changes. Targeted students include members of the steering committee, nontechnical members of the BPR team and managers and senior employees involved in the process to be redesigned. The latter group needs the information so that it can contribute ideas and validate conclusions.

This brief educational phase not only permits participating company staffers to improve their contribution to the BPR effort, but it can also allay the fears change brings. In one case, the employees' union at a major Scandinavian freight forwarding company threatened to go on strike to prevent the redesign of forwarding specialists' jobs. It was only by educating the staff about the potential of information technology, how their jobs could be made more interesting and how the project would help to ensure the company's survival that the strike was averted.

It is not, however, necessary to remake every manager or employee into a systems analyst nor to teach each one the details of the technology. Instead, they must be taught the basic functions they can perform by combining computers and data communications.

It is important that they understand how applications replace labor-intensive work, ensure the reliable storage and retrieval of information, enable changes in the sequence with which work is performed, provide additional information needed to manage the business process or even reduce the amount of information necessary to manage a business process.

Application examples and brief descriptions of appropriate technologies and their capabilities can be used to develop a short course for the steering committee and for supervisory personnel and key employees in the business process.

STEP 5

Identifying change opportunities. Armed with the knowledge of enabling technology provided in Step Four, the BPR team, process managers and key senior employees are ready to become more intimately involved in changing the way things work.

The BPR team prepares material for a series of brainstorming workshops. The primary purpose of the workshop series is to verify the description of the current business process and obtain ideas to change the process.

Presentation material can consist of flip charts or slides describing the objectives of the BPR project; the reasons for the project (from Steps One and Two); the methods used in the BPR analysis up to this point; a diagrammed description of

company's accounts payable operation and a 75% reduction in head count.

The BPR project team should document the workshop conclusions and hold a final review session in which it validates those conclusions. After it feels everyone is in agreement, the BPR project team should prepare a workshop for the steering committee.

In addition to the material prepared for the previous workshop, the BPR team should pull together the following presentation:

- The changes to the business process recommended by the initial workshops.
- Comments on the technical feasibility of suggested changes.
- Comments on the roughly estimated costs of the suggested changes.
- Comments on the expected benefits of

organizational changes, the team recommends changes in technology, such as replacing systems or applications or acquiring new systems altogether.

With the assistance of all relevant IS staff members, the team provides costs and pinpoints trade-offs among possible implementation paths. It also delineates how the new processes will affect other processes throughout the organization. It calculates how long the redesign will take and what risks are involved. Finally, the team outlines the benefits, recommends a course of action and delineates an action plan.

The team presents a draft of its final proposal, including costs and schedules, to the steering committee to gain its concurrence and support and incorporates the committee members' comments or

Misunderstanding can doom a project

Business process redesign is not successful in all cases. Failure often stems from companies' misunderstanding of what the concept is and then application of that incorrect idea to the existing processes.

Many companies have arrived at their current organizational setups by historical accident. Organization forms have been initiated as a result of the special skills or political strength of key individuals and, as a result, of the available state of the technology used by the company at some time in the past.

Rarely have these organizations been constructed as the result of a holistic view of the processes used by the company.

Just as many of the efforts at automating production resulted in "islands of automation," many of the organizational units at today's companies are "islands of subprocesses."

As such, these islands have had to be linked by artificial — and often expensive and time-consuming — methods to make them a part of the overall business process.

What today is often labeled "business process redesign" is actually the tying together of these fragmentary, inefficient subprocesses.

In fact, a substantial amount of the investment in information technology is devoted to supporting these linkages and

passing information among the islands.

As companies have grown to international proportions and organization units have become separated by time and distance, the islands have become archipelagos. Automating existing business processes does not result in gains in business operations.

This kludgy and costly jury-rigging has done little to prove the worth of business process redesign or convince management that it is worthwhile.

In fact, surveys indicate that most senior business managers are not convinced that using technology to transform business processes is a key factor in competitive positioning. Rather, they think of the approach as a new way for computer vendors to sell more products.

Because it sees little improvement but great cost, organization management resists major change or the shifting of authority and responsibility. Instead, it opts for incremental improvements that create as little change (disturbance) as possible.

The first four decades of increased use of information technology have at best resulted in many systems that support parts of processes.

At worst, the systems have fostered the creation of new islands of white-collar employment and have caused organizations to stagnate.

LOUIS FRIED



the current business process; a diagnosis of the causes of current problems and their effects; and the expected results of the workshop.

After the participants verify that the flow of the current process has been accurately represented and they have annotated any comments, the BPR team members should open the discussion by suggesting process changes to workshop participants.

The idea here is to brainstorm. No suggestion, however outrageous, should be rejected. The team should encourage ideas that challenge existing organization structures, sequences of work, geographic locations of work, the existing approval process and unwritten assumptions that underlie the current processes.

At Ford Motor Co., for example, the unwritten assumption for the company's accounts payable process was that payment was made on delivery of an invoice. The new assumption, that payment should be made on delivery of the goods, permitted a complete redesign of the

suggested changes.

In its workshops with steering committee members, the project team presents and discusses composite material developed to date. Steering committee members and the BPR team will likely have additional suggestions for changes. Out of this series of workshops should come preliminary recommendations for changing the business process so that it fits with the company's objectives and internal environment.

When the BPR project team reaches the conclusion of Step Five, the company will have in hand an initial proposal for redesigning its business process.

STEP 6

Analysis of recommended action. The BPR team now prepares documents on the final new process and information flows for the business as well as documenting the organizational changes necessary for implementation.

To support these new flows and orga-

nizations in a final proposal that the steering committee will make to top management.

The recommendations resulting from this step will establish a new paradigm for the business process.

STEP 7

Approval and commitment. What emerges from Step Six is a coherent proposal for business process redesign that can be presented to those managers who give approval on investment in the new process and take responsibility for the outcome of the changes.

The objectives of BPR must be audacious. The management objectives must set targets that stretch the imagination beyond the confines of the present organization, the accepted ways of doing things and the current process sequence.

Only by striving for grand results can companies stimulate the breakthrough thinking that will make a difference to their profitability. •

These days, technology has to serve everybody. The trouble is, everyone wants technology to do something different.

IS managers, for instance, are apt to put

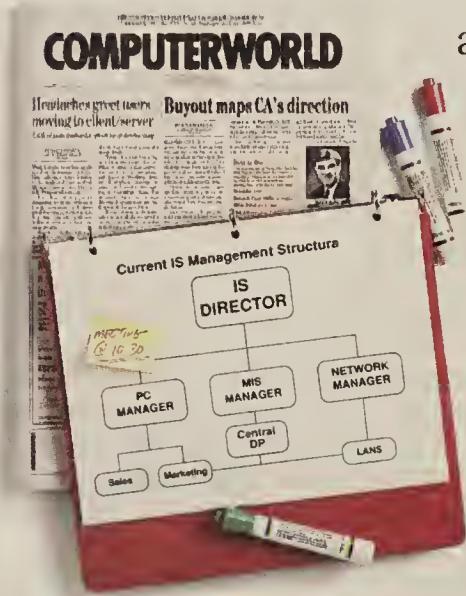
a very strategic spin on things. That's because they're charged with

delivering information throughout the enterprise, integrating the company's computing and communications resources.

CIO's tend to look at the whole enterprise another way.

After all, they're tackling some of the very trickiest issues in business.

Like how to best use



If there were only one kind of computer buyer, we'd only have one computer publication.



technology to produce the greatest business management gains.

Department managers, on the other hand, have to focus on doing just what their name implies. So they're more concerned with the productivity issues in their own backyard,

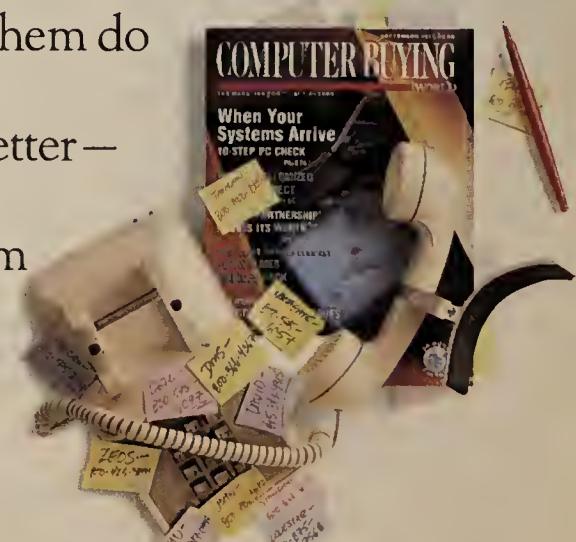
their local area networks, and generally making sure their department is happy and humming along.

End users, however, have a different perspective

entirely. They see the world from their desktop.

They want whatever helps them do

what they do better—while giving them access to the rest of the work-group or a mainframe.



NETWORK WORLD



Then there's senior management. To them, technology is one of the best ways to gain a strategic, competitive advantage. Or, at least, it better be.

The point is, everybody's involved. All these groups influence each other. That's why, today, there's no one person who's responsible for buying technology for the many. Instead, in the

NEXTWORLD



networked corporation, there is a network of people who are responsible

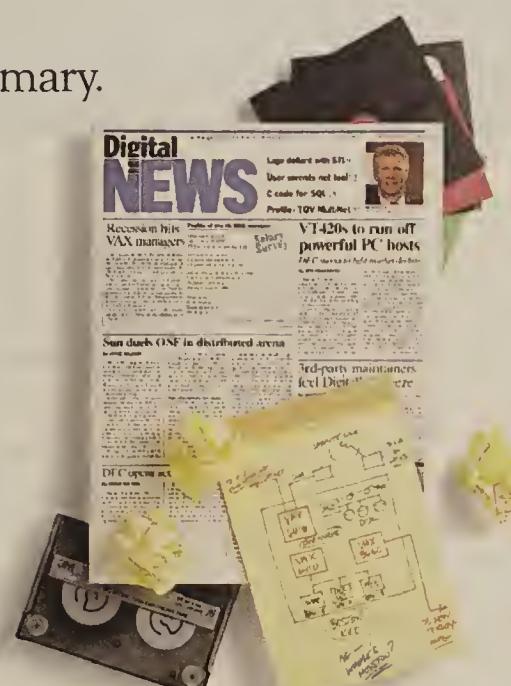
for buying and implementing technology, each responding to different needs and demands.

That's why they all need different kinds of information, presented in different ways, to help them do their jobs. And why

we have more than one kind of computer publication. In fact, IDG has more ways to reach more of your market than anyone. We also know more than anyone about how information technology is bought, having just completed the largest independent study of the buying process ever conducted.

It's called, "Buying IT in the 90s: The People, Patterns, and Process." And we'd like to share it with you. Just call Erica Baccus, our V.P. of Marketing, at 1-617-534-1210, for a free copy of the Executive Summary.

And find out why nobody knows more about how to reach more of your market than we do.



IDG
INTERNATIONAL DATA GROUP
The World of Information Technology

© 1991 International Data Group, 1 Exeter Plaza, Boston, MA 02116. 1-617-534-1200
Brand or product names are trademarks or registered trademarks of their respective holders

There's No Such Thing as Bad News.

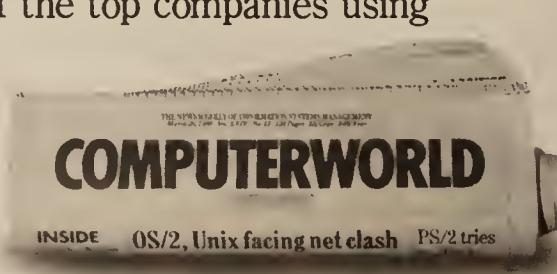
When it comes to the events, the technology, the trends, the products, and the people that shape the IS industry, you need to know it all — the good and the bad.

Not a month or so after it happens, but the minute news breaks. So you can plan your strategy and take action — before it's too late.

Computerworld is the only weekly news source for IS professionals. Each issue is filled cover to cover with up-to-the-minute news you need to know. We bring you the good, the bad, and everything in between.

Order your own subscription to *Computerworld* and you'll receive 51 information-packed issues. Plus you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

Use the postage-paid subscription card bound into this issue to order your copy today. Because whether the news is good or bad, it's still news you can use.



COMPUTER INDUSTRY

NATIONAL BRIEFS

To the (Floating) Point

► Cray Research, Inc. may soon be selling its Y-MP EL supercomputers through Digital Equipment Corp. and adapting technology from Floating Point Systems, Inc., according to Chief Executive Officer John Rollwagen. Cray's decision to buy some or all of Floating Point was called off Nov. 11, then called back on again four days later. "It's been an interesting negotiation, to say the least," Rollwagen said, adding that Cray's bidding price remains at \$3.2 million.

Big Easy buy

► Northridge, Calif.-based computer leasing firm El Camino Resources Ltd. last week branched further into the applications software market and put down its first Louisiana roots with the acquisition of certain assets of New Orleans-based Darcor. The purchase, consummated for an undisclosed price, was made through El Camino's Application Solutions Co. division.

Peaceful, easy feeling

► Digital Communications Associates, Inc. settled a securities class action last week that had been pending against the firm and several of its individual higher-ups. According to the Alpharetta, Ga.-based personal computer products vendor, insurance will cover \$3 million of the \$6.25 million price of the out-of-court accords; the remaining amount will show up as a charge against earnings in the company's current quarter.

Fresh start

► With the closing of a \$110.6 million bond exchange and the restructuring of its \$53.3 million bank term loan, real-time systems vendor Concurrent Computer Corp. put the last blocks into place to complete its reorganization and recapitalization. Since devastating financial reverses put the firm's existence in peril in late 1990, CEO Dennis Brown said, "We have defied the experts by avoiding an involuntary Chapter 11, recapitalizing, recruiting a new and talented management team, maintaining our worldwide customer base and developing and marketing new products." And all this during a recession and with the financial and credit markets in chaos, according to Brown.

ISSC could be role model for parent IBM

BY NELL MARGOLIS
CW STAFF

TARRYTOWN, N.Y. — IBM has seen the future, and it is ISSC.

IBM Systems Solutions Corp. (ISSC), IBM's 6-month-old outsourcing subsidiary, was created not only to speed its struggling parent's march into the services arena it hopes to dominate in decades to come but also to serve as a laboratory model of how to leverage scrappy, agile entrepreneurial efforts out of a bureaucratic monolith. During the next few years, ISSC President Dennie M. Welsh said, "IBM is going to start looking more and more like us."

Recent reports of changes at IBM — aimed at whipping it into an aggregation of centrally bonded but highly autonomous business units able to turn on a dime to deliver products and services [CW, Nov. 25] — indicate that Welsh is on the right track. Early users of ISSC's avowedly customer-tailored, highly flexible brand of information systems services say they are getting what they were promised and liking what they get.

Some industry observers raise questions: Is ISSC pricing deals below the profit line? Is IBM reversing its hardware orientation or just repackaging it? To what extent are users locking

themselves into IBM equipment by outsourcing to ISSC?

"ISSC is doing real well with us," said David Karney, IS vice president at Dallas-based Zale Corp., the nationwide jewelry

marketing systems platforms.

Perhaps most significantly, Karney added, ISSC's performance has tracked its promise with regard to the commercial, as well as the technological, as-

we've resolved that 100%."

Thumbs-up for the ISSC relationship are not limited to Zale headquarters or to the IS department. In Baltimore, store manager Michelle Fuller expressed delight with the IBM in-store system she has been using since May — and for the IBM help line managed by ISSC.

At First Tennessee National Corp. in Memphis, Executive Vice President John Kelly said he was hard-pressed to find a downside to the bank's 1989 outsourcing deal made with IBM and inherited by ISSC. "We had two goals," Kelly said: "Find a technology partner that could keep us current with the latest in banking technology, and lower our costs on everything that's become a commodity." On both scores, Kelly said, "We got what we bargained for."

Nevertheless, industry observers caution, it is still early in a chancy and hotly contested game — one in which, several noted ironically, ISSC's most dangerous wild card is also its ace: the 6-month-old subsidiary's ties to IBM.

"Users should fear two things about ISSC," said Robert Djurdjevic, president of Phoenix-based Annex Research: "The loss of control that comes with outsourcing in general, and the wisdom of putting that control in

Continued on page 101

At a glance ...

ISSC

Like sister subsidiary IBM Credit Corp., IBM's latest offspring is already big and looking to grow quickly



Dennie M. Welsh

May 1991

Tarrytown, N.Y.

5,000

Dennie M. Welsh

Approximately \$300 million as of June (per Annex Research figures)

Estimated growth rate: In excess of 100% annually over the next 2 years

Source: Integrated Systems Solutions Corp. and Annex Research

chain, which signed a 10-year, multimillion-dollar outsourcing and business consulting deal with ISSC in June. Since then, Karney said, ISSC has implemented two of three point-of-sale systems it was hired to complete — a 650-store effort, "a lot of work pulling together our various systems" — and standardized the firm's disparate op-

erations of outsourcing. "They've paid scrupulous attention to the needs of our particular business," he said — for instance, stalling a project rather than risking the slightest disruption to the jeweler's critical holiday sales season. "Morale dipped pretty low here when people first heard the word 'outsourcing,'" Karney said. "I'd say

Noncompete won't halt Landry's agenda

BY NELL MARGOLIS
CW STAFF

CAMBRIDGE, Mass. — The noncompete agreement John B. Landry III signed with Dun & Bradstreet Software will not cramp the software guru as he assumes his new Lotus position.

So said Landry late last month, in the hours after he suddenly resigned as D&B Software's executive vice president and chief technology officer and re-emerged with a similar title and mission at Lotus Development Corp.

Declining to detail the agreement "because that's what lawyers do, and I'm not a lawyer," the software executive nevertheless was explicit on one point: "There is nothing in the agreement that will keep me from becoming involved in any of the activities [on my prospective

agenda] at Lotus."

Noncompete agreements, a standard fixture in most executive employment packages, spell out the extent to which a departing employee can directly or indirectly engage in rivalry with a former firm for a defined period of time — usually one to two years. Questions about Landry's possible restrictions under such an agreement were triggered early in the game by two particular circumstances:

- Industry observers have not forgotten the 1989 departure of former D&B Software executive Frank Dodge [CW, March 12 and 19, 1990] amid a maelstrom of legal hostilities over the provisions of Dodge's noncompete agreement. D&B Software pre-

vailed in court, and Dodge was sidelined from the applications software industry for a year.

- While at D&B Software, Landry was instrumental in the development of Wijit, a graphical user interface geared to facilitate information sharing in a client/server environment and positioned as a key component of D&B Software's coming product generation.

As Landry spearheads technological development at Lotus, he could be expected to encounter Notes, a critically praised Lotus offering that bears a strikingly similar description to Wijit.

Last week, Landry dismissed industry concerns on both scores — although he reiterated that the industry would basically have to take his word for it that the agreement, which he confirmed does exist, would pose no problem.

Wijit and Notes, he said, are technologically and contextually distinguishable. Wijit "is an environment. We [D&B] implement-



ed a series of products, code-named Gemini, as a subsystem under Wijit. Notes doesn't have that." In fact, he said, "I certainly think the potential exists" for Wijit and Notes to work together. While there are no plans for a D&B Software/Lotus alliance currently in the works, he said, "I wouldn't foreclose the possibility.

Exactly what his new agenda will be, Landry said, will emerge only over time. He does not officially begin work at Lotus until next week, and the extent to which he was selected specifically for his abilities to inspire others necessarily defies a detailed blueprint.

However, in a teleconference held within hours of his announcement, he indicated that he will guide the firm further toward the organizational computing market. "Organizational computing is on the rise, and dramatically," he noted, "but the missionary work maybe hasn't gotten off in the best way."

"As people come to know it and understand it, they will flock to groupware."

EDS tightens French side

BY MARC BENITAH
IDG NEWS SERVICE

PARIS — Four months ago, Dallas-based Electronic Data Systems Corp. waged a successful hostile takeover battle against UK-based systems integrator and outsourcing SD-Scicon. EDS integrated its acquisition into its already established strategic British business unit. Yet EDS still has not absorbed GFI, the French subsidiary of SD-Scicon.

After months of uncertainty, the fog is just beginning to lift: GFI could finally incorporate the French subsidiary of its

new parent company — EDS France — into its operations.

EDS took managerial control of SD-Scicon's companies on Aug. 19. At the end of August, a steering committee was formed to integrate SD-Scicon UK and GFI into EDS. Although Jacques Tordjman, chief executive officer at GFI, holds a seat on the steering committee, no other EDS France representatives were invited to join.

As a result, SD-Scicon managers immediately found themselves on the sidelines. John Bateman, formerly technical director at EDS Europe, took control of

SD-Scicon. But GFI, which had previously reported to London, began reporting directly to EDS headquarters in Dallas, thereby circumventing John Bateman and EDS Europe's Geneva headquarters.

In September, EDS International launched an audit of GFI. In mid-October, during an EDS International executive committee seminar in Jerusalem, Tordjman was confirmed as CEO. EDS asked him for a strategic plan focusing on France but also validating EDS' other strategic areas.

The major goal is clear: EDS France and GFI should be merged before the summer. "EDS France and GFI will coexist for a while," Tordjman said, "but within 10 months, there will only be a single entity."

Meanwhile, GFI hardly has a relationship with EDS France, although the two companies cannot afford to ignore each other. They have just set up a "coordinating structure" in order to mesh their activities.

"Today we aren't part of EDS France's business except to respond to our clients in order to create a homogeneous image of the group," Tordjman said.

This structure divides the two companies' demands but also seems to prepare them to integrate even if Tordjman refuses to recognize it.

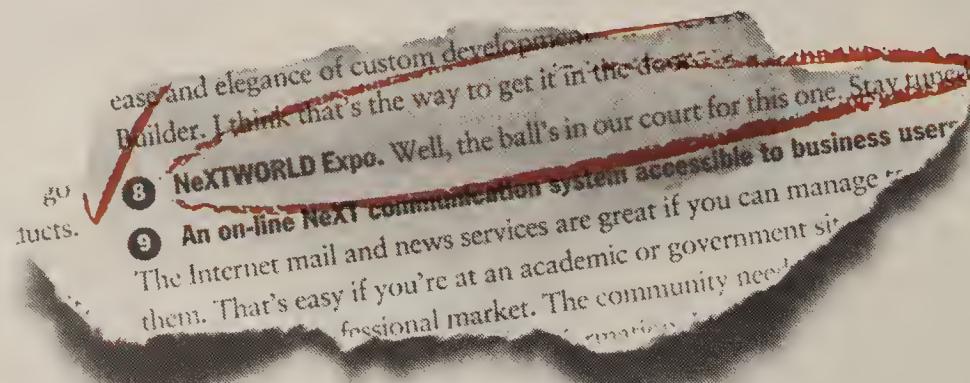
"We are [currently] not in a position to publicly disclose our organization decisions," a spokesman for EDS France said. Nevertheless, the disclaimer implicitly recognized that the process is under way.

The only visible effect of the takeover of GFI is that it now offers systems management services, formerly an exclusive EDS preserve.

GFI, which will now assume all of the activities of its French subsidiary, manifests an uncontrollable dynamism. After reporting 73% growth in revenue in 1990, GFI expects a 30% increase in 1991 — 15% of which is internal. According to Tordjman, the company is expected to post over \$232 million in revenue and improve margins this year. Employee count, pegged at around 1,150 in June 1990, now stands at approximately 2,400.

Benitah writes for Le Monde Informatique, an IDG Communications French publication.

IN THE FALL 1991 ISSUE, NeXTWORLD MAGAZINE PRINTED ITS TEN MOST WANTED LIST.



MAKE THAT 9.

Now you can check off Number 8. Because NeXTWORLD™ Expo comes to San Francisco Civic Auditorium and Brooks Hall, January 22-24, 1992.

This educational conference and product exposition is the first-ever gathering of the worldwide NeXT™ community. And it happens in conjunction with the first international Developers Conference, an all-in-one forum for those who want to know more about the only true object-oriented system software available today—NeXTstep™.

Visit scores of product exhibits. Try your hand at the latest in NeXT hardware, software, and peripherals. Meet with leading-edge users and resellers. And learn from people who are already putting the NeXT computer to work in business, government, and education.

Attend in-depth workshops and dynamic sessions led by speakers like Stewart Alsop, Vicki Brown, and Jonathan Seybold. And hear a keynote address by Steve Jobs, President and CEO of NeXT Computer, Inc.

Discover how the NeXTstep development environment is revolutionizing the way software is created. And find out how interpersonal computing can dramatically improve productivity in your entire company, department, or university.

Do all this and more in one place, under one roof.

NEXTWORLD EXPO

January 22-24, 1992 • San Francisco

Call 1-800-227-EXPO

or write to:

NeXTWORLD Expo, c/o World Expo Corp., P.O. 9107, 111 Speen St., Framingham, MA 01701-9107.

Or fax this coupon to us at 508-872-8237.

ANNOUNCING NeXTWORLD EXPO. JANUARY 22-24, 1992, SAN FRANCISCO. NeXTWORLD Expo literally has something for everyone interested in NeXT technology. It even includes the first global User Group

Meeting—free with all registrations.

So register today for NeXTWORLD Expo, January 22-24, San Francisco. And don't forget to check it off your own Most Wanted List.

DON'T MISS THE FIRST EVENT FOR THE NeXT GENERATION. REGISTER BY DECEMBER 30, AND SAVE UP TO \$100.

Simply check the appropriate boxes below, then mail your payment to: NeXTWORLD Expo, c/o World Expo Corp., P.O. 9107, 111 Speen St., Framingham, MA 01701-9107. Or fax this coupon to us at 508-872-8237. Questions? Call the NeXTWORLD Expo 24-hour hotline at 508-872-0900.

| CHECK BELOW: | BEFORE | AFTER |
|--|--------|-------|
| <input type="checkbox"/> Exhibits Only & Keynotes (1/22, 1/23) | \$25 | \$40 |
| <input type="checkbox"/> 2-day Users Conference & Exhibits (1/22, 1/23) | \$95 | \$150 |
| <input type="checkbox"/> 3-day Developers Conference & Exhibits (1/22-1/24) | \$395 | \$495 |
| <input type="checkbox"/> User Group Meeting free with all registrations (1/24) | | |

METHOD OF PAYMENT:

Check enclosed (payable to NeXTWORLD Expo) Amount enclosed: _____
 MasterCard VISA American Express \$ _____
 Card # _____ Exp. Date _____

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY/STATE/ZIP _____

COUNTRY _____

PHONE _____

NX1

©1991 NeXT Computer, Inc. All rights reserved. NeXT logo, NeXTstep, and NeXTWORLD are trademarks of NeXT Computer, Inc. NeXTWORLD Expo is sponsored by NeXTWORLD magazine, and is managed by World Expo Corporation, both are International Data Group companies.

Unigraphics shares plans

BY ELLIS BOOKER
CW STAFF

CHICAGO — Computer-aided design and manufacturing (CAD/CAM) player Unigraphics, a unit of McDonnell Douglas Systems Integration Co. (MDSI) until its recent acquisition by outsourcing giant Electronic Data Systems Corp., was the belle of the ball at the Autofact '91 conference held here last month.

Arriving in Chicago on the heels of EDS' Nov. 4 acquisition of MDSI, Unigraphics officials talked excitedly about the EDS relationship.

"The MDSI relationship was valued and important," John Mazzola, head of Unigraphics and now an EDS executive as well, told a gathering of EDS and Unigraphics employees and customers.

"But over the past few years, we've pretty much pushed as far as we could go," Mazzola said. EDS would help Unigraphics realize its full potential in the commercial marketplace.

Mazzola went so far as to predict that Unigraphics would be the No. 2 CAD/CAM vendor by 1994.

Within days of the acquisition's closing, in fact, Unigraphics announced two major contracts: one with Caterpillar, Inc. and one with General Electric Co.

The Caterpillar contract calls for the installation of more than 2,000 Unigraphics "seats." The GE contract "is even bigger," Unigraphics sources said. However, they would not provide financial details on either contract.

INTERNATIONAL BRIEFS

Fingers in the pie

► Fujitsu Ltd. and other Japanese mainframe manufacturers are moving to bring out their own distributed relational database management systems to take advantage of Japan's market for third-party RDBMS products. According to a recent report in the Japanese business press, Fujitsu's RDBMS will be targeted at Unix systems.

Going, going, gone

► In the latest stage of its massive privatization, newly free Eastern Germany is set to sell 14 state-owned computer centers. The Treuhandanstalt — the body created to sell some 9,000 state-owned firms to the private sector — is inviting buyers from outside the country to bid for the businesses, which are located in 14 major German cities, including Berlin, Frankfurt, Potsdam, Leipzig and Dresden.

Ericsson posts loss

► Swedish telecommunications giant L.M. Ericsson cited a prolonged weakness in the telecommunications industry as the chief reason for the firm's 53% plunge in nine-month profits and a \$44.8 million net loss in its third-quarter fiscal 1991. The \$252 million profit for its first nine months marked a steep drop from the \$542 million logged in the corresponding period in 1990.

Siemens/Nixdorf's red ink

► Siemens/Nixdorf Informationssysteme AG announced a \$475 million loss for its 1990-91 business year ended Sept. 30. The loss may not be the last; according to a report in the European business press, Siemens/Nixdorf predicted an upswing in earnings during the current year but perhaps not a return to profitability.

ISSC could be role model for IBM

CONTINUED FROM PAGE 99

the company that supplies your hardware" (see story below).

ISSC was conceived in 1989 as part of IBM's National Services Group. "At that point," market planning manager Lane Jorgensen said, "we were basically operations-oriented."

All things to all people

By the time the firm got its own corporate charter in May (see chart page 99), it had left its operations-only agenda in the dust. While some firms, bent on honing focus, are disavowing the urge to be all things to all people, ISSC is virtually making that its calling card.

The company has targeted eight vertical markets — banking, insurance, transportation, manufacturing and process, government, utilities, health/medical and retail — and is wooing them with a broad-based portfo-

lio of offerings from one-shot consulting to full-tilt outsourcing with consulting services and software codevelopment added.

The game plan, Welsh said, is not just to go wide, but deep. "Understanding the require-

ments of each customer's business so that you can meaningfully customize each application — each idea — is one of the hardest challenges we've got." ISSC is meeting it head-on, Welsh said. For instance, a cadre of seasoned

How to grow an outsourcing player

Within weeks of opening its doors, ISSC signed a 10-year outsourcing deal with Zale Corp. Since then, the following nine firms have signed on, and 52 deals are currently pending:

| | |
|-------|--------------------------------------|
| July | Cullum Cos. |
| | Supermarkets General Corp. |
| | Matson Navigation Co. |
| Aug. | First American National Bank (Tenn.) |
| | Commerce Bancshares, Inc. |
| | Yankee Gas Services Co. |
| Sept. | Comdata Holdings Corp. |
| Oct. | Chase Manhattan Bank of Connecticut |
| Nov. | Foremost Corporation of America |

CW Chart: Michael Siggins

Family tie pulls both ways

How can IBM subsidiary ISSC, whose sales force accompanies IBM's on customer calls, claim to be truly independent from its parent?

"We can't," President Dennis M. Welsh said. What's more, he quickly added, "we'd never want to."

The factor that lets ISSC attempt to cut a broad swath across an outsourcing landscape already staked by power players such as Andersen Consulting, Computer Sciences Corp. and particularly Electronic Data Systems Corp. is the same one that analysts cite as the firm's No. 1 liability — its ties to IBM.

Some analysts are quick to warn users that an outsourcing deal with ISSC means hitching your company's pivotal information systems operations to a struggling hardware vendor desperate to gain or retain account control in search of the lush, big-ticket, wide-margin sales that only big iron brings.

Wrong, Welsh said. IBM's massive resources are key to ISSC's ability to offer top services at less than top dollar.

For instance, he noted, ISSC draws on the resources of sister subsidiary IBM Credit Corp.

(ICC) for the asset management parts of its business.

"We also use ICC as our lending partner, whether we're buying from IBM or from others," he said.

Similarly, Welsh said, ISSC can leverage IBM's 80-plus business partners, tap into decades of development expertise up and down the software and hardware spectrum, give its customers the inside track on IBM development plans and pass on the price advantage of intra-corporate bulk purchases. The savings, he added, allow ISSC to offer attractive prices and still make a profit.

And while the insider prices might give IBM an inside track at user sites, Welsh insists that ISSC will buy whatever equipment best meets the user's strategic needs.

At least one user said the claim is true: ISSC recently put Dell Computer Corp. personal computers into several hundred Zale Corp. stores when it turned out that IBM's Personal System/2 was not object-code-compatible with the user's application software, according to Zale IS Vice President David Karney.

NELL MARGOLIS

Coalition seeks to bolster European computer industry

IDG NEWS SERVICE

PARIS — A group of European companies — including Germany's Daimler-Benz AG, Britain's Inmos and Spain's Casa — is reportedly working with universities and research institutes to develop high-performance parallel processor-driven computing systems for European industry.

The coalition, known as EI3, will cover hardware and software equipment and services. Its

aim, according to an EI3 spokesman, is to "enable European industry to reduce the dependency on U.S. and Japanese technology sources."

Industry observers, however, noted that advanced systems of the kind proposed already operate in all of these countries.

A 16-member group launched the initiative last month to try to attract other firms in Europe that want to develop more powerful computing technologies for their products.

EI3's blueprint is based on technology in which computers work in concert to solve a problem by breaking it up into different parts. "European programs and projects have successfully acquired a technological edge in the parallel processing field," EI3's liaison office said.

Group founders on the research and development side include Inmos, a subsidiary of SGS-Thomson, the French/Italian concern. Inmos has had a strong influence on the development of parallel processing, as has Parsytec, a German member of the initiative.

"The European technological edge has to be turned into an industrial advantage," EI3's liai-

son office added.

In addition to Daimler-Benz's own research institute, the group's AEG Electrocom subsidiary and its Dornier engineering unit are also involved, as is Telefunken Systemtechnik (part of Deutsche Aerospace, which is owned by Daimler-Benz). Piraike-Patraiki, a Greek weaving company, is also a member.

Cap Gemini Sogeti, the French software house in which Daimler-Benz recently acquired a minority stake, is also involved in EI3, along with TNO, the Dutch research institute; Fraunhofer, an independent German research body; Hitec, a Greek software house; and Inesc, a Portuguese research organization.

banking professionals has been brought on board to help educate and train ISSC employees headed for work with banking clients.

In 1992, Welsh said, the program — which is already being extended to other vertical markets — will open up to entry-level candidates, so that ISSC can grow its own bankers as well.

Six months out of the starting gate, ISSC has had too short a run for its success to seem assured or its failure to be feared, users and analysts agreed. "They're the new kid on the block," Djurdjevic said, "and they're going to make a few mistakes. They're also going to have some beginner's luck." At this stage of the game, he cautioned, reading too much into either would be a mistake.

Bobby Gnisham, an executive at rival Electronic Data Systems Corp., said ISSC is showing up with increasing frequency. "We used to run into IBM once in a while," he said. "We see ISSC on just about every deal."

EXECUTIVE CORNER

Rogers voted in as CEO

The election of Richard G. Rogers as president and chief executive officer of West Long Branch, N.J.-based **Electronic Associates, Inc.** has been announced by the board of directors. Rogers, an electronics industry veteran who most recently served as chief operating officer at BTU International, replaces former Electronic Associates President Robert G. Finney, who resigned last summer.

Ventura Software, Inc., a wholly owned subsidiary of **Xerox Corp.**, has elected David W. Hanna as president and CEO. Hanna, who has served on the Ventura board of directors since the subsidiary was formed in 1990, formerly headed up the David Hanna Co., a consulting firm specializing in high-tech marketing and strategy. He also served as president of four technology firms: Grid Systems Corp., Altos Computer Systems, Versatec, Inc. and, most recently, Emulex Corp.

Marc S. Shinbrook has been named president and CEO of **Rochester Software Connection, Inc.**, a Rochester, Minn.-based provider of personal computer-to-Application System/400 cooperative processing software. Shinbrook has held senior management positions at several software companies, including Cullinet Software, Inc., now part of Computer Associates International, Inc., and Business Software Technology, Inc., now part of Legent Corp.

Technology Investment A Big Name For A Big

Global Perspective

Technology Investment Strategies Corporation helps corporate executives around the world make their strategic business decisions about information technology.

Being a subsidiary of International Data Group has its advantages – specifically, access to 4,000 employees in 49 countries focused on the information industry.

Research And Consulting

- Technology Investment Strategies Corporation
- International Data Corporation
- IDC Financial Services Corporation
- Information Strategies Group
- Link Resources
- 34 International Research Companies

Conferences

- World Expo Corporation
- Communication Networks, Network Computing Forum, CD-ROM Expo, MACWORLD Expo, Berlin Unix Forum, Sun World Expo, and other events in 14 countries.

Database

- 160,000 computer sites worldwide
- 5,000 U.S. value-added resellers
- Two million computer executives worldwide

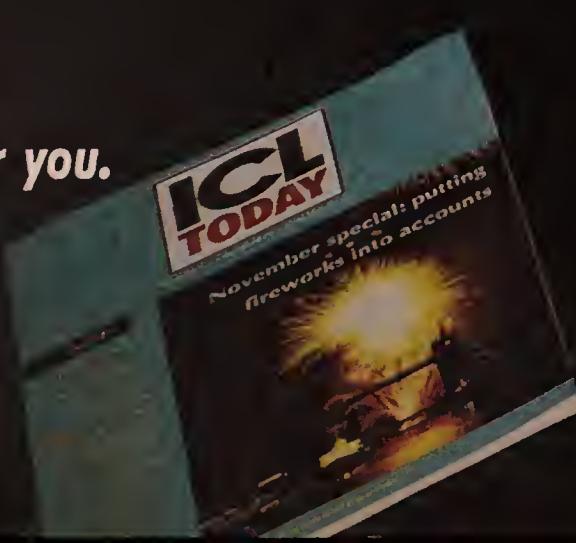
Training

- ExecuTrain
- Training over 150,000 individuals each year
- More than 100 courses on the most popular software

Books

- IDG Books Worldwide, Inc.

*Our analysts are expert at
exploiting this network for you.*



A world of



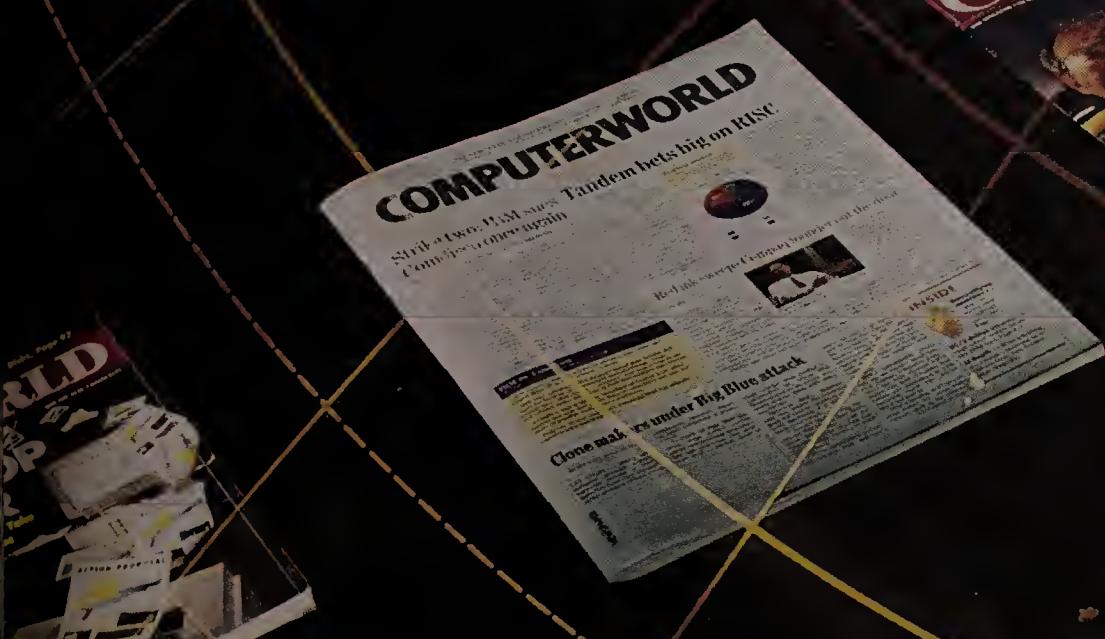
Technology Investment
Strategies Corporation

AN IDG COMPANY

1-800-726-TISC

Strategies Corporation— Company.

Information on information



These are among the 150 publications with 25 million readers worldwide.

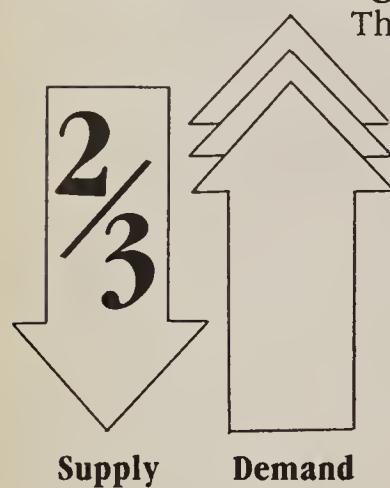
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better — and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who



would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that

reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

| For every 10 of today's computer job seekers . . . |
|--|
| 2 are Active <input type="checkbox"/> <input checked="" type="checkbox"/> |
| 7 are Passive <input type="checkbox"/> |
| 1 is a Non-mover <input type="checkbox"/> |

reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

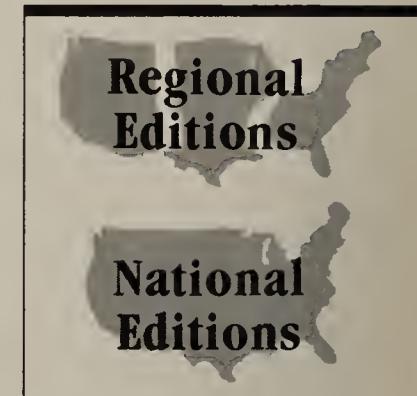
More job seekers see your ad in *Computerworld* than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.



Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just \$166.32 per inch, your cost-per qualified candidate reached is better than *any* newspaper — Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad

Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive or active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.



For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



Weekly. Regional. National.
And it works.

COMPUTER CAREERS

Why lack of a degree may hurt you now

In a tough job market, education is seen as a necessary supplement to skills and IS experience

BY BARBARA FRANCETT
SPECIAL TO CW

OK, so something came up — money problems, family obligations, military service — and you didn't finish college, either recently or way back when. Or you completed a technical or two-year course of study and went to work. Does the lack of a four-year degree mean a dead end for your information systems career?

The answer is this: It depends who you work for and how high you set your sights. Unquestionably, skills, experience, confidence and ambition go far to level the playing field for seasoned IS pros, especially those who have been in the field for 10 or more years. However, the less experienced may find the lack of a degree an obstacle to their career paths. For job-market newcomers, it's a definite roadblock.

Frank Panella started out at Dow Jones & Co. in Princeton, N.J., 24 years ago as a computer programmer with a two-year degree in computer science. Over the years, Panella has progressed through project leader, manager, assistant director and director slots. Today, he is executive di-

rector of worldwide operations and says he has yet to find his lack of a four-year degree a drawback.

"My promotions have been based on my experience and skills," he explains.

He claims his educational background has never been an issue with his superiors, peers or subordinates. "I've never felt incompetent in any way."

Despite his own success, Panella strongly advises the younger generation to stick with school: If he were beginning his career today, he says, he'd have a much tougher time getting where he is now — or even in the door.

"Anyone starting out today must have a four-year degree," Panella says. "I can't reinforce it enough for the young people now coming up through the organization."

Times have changed

Part of the reason IS professionals didn't have to be degreed in the past is that there were few degree programs designed for them. Today, that has changed.

"Back in the '60s, there were only a few technical courses available," Panella says. "Now, there are full-blown educational

programs," he adds.

Second, the economy is soft, and competition is brutal. Lack of a degree is one more thing recruiters can note as they wade through a surfeit of resumes, says Robert Lobman, a member of the MIS Network Group, a support group of about 200 unemployed IS professionals, two-thirds of whom are degreed.

"In the old days, an employer might give a recruiter a list of 15 requirements, and you only needed 10 or 12 to get the job," he says. "Now, you need all 15. If one of those is a four-year degree and you don't have one, that's a knockout factor."

The point is, today's job market is stringent in the extreme. The more attributes a candidate can offer, the better.

That's also the case for long-time professionals envisioning a place in management and up to the executive suite. They may well find the doors closed to the nondegreed, no matter how brilliant the performer.

Thomas Loane, vice president of computers and communications at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., is an avid proponent of higher education for his staff members. "We live in a credentialed society, and the absence of a degree hurts," Loane says.

Mary Kimball, Alamo's direc-

tor of telecommunications, is currently pursuing her bachelor's degree, even though she says that her career hasn't suffered thus far without it. "It hasn't been a detriment," she says. "My experience and business sense couldn't be gotten by just anybody off the street."

WE LIVE IN a credentialed society, and the absence of a degree hurts."

THOMAS LOANE
ALAMO RENT A CAR

a telecommunications person," she says. An MBA is her next educational goal.

Recruiters agree this is a smart move. They advise older IS professionals to consider adding academic credentials to their base of practical experience. It is good employment insurance in these days of rampant mergers and downsizings, they say. Not everyone may value your experience as highly as your current employer.

Stick with it

"Senior managers don't understand how it is until they're out on the streets," says Kathy Nichol, a vice president at Datapro Personnel Consultants in Dallas. She cites the case of a nondegreed manager, formerly earning \$110,000 a year, who has now been unemployed for two years. "Big companies think something is missing in the background of someone who can't stick out a four-year program," she says.

That said, there are still employers who value accomplishments over a sheepskin. They may be harder to find in the current market, but they're out there.

"My criteria is, the best person qualified for the job regardless of education," says Joseph Wodushek, electronic data processing director at Waukesha Engine in Waukesha, Wis. "Generally, in DP, experience has a lot of bearing on hiring."

Francett is a free-lance writer based in Bloomfield, N.J.

C MUMPS
O Mac/Oracle
N SYBASE
L LAN Mgr.
S C: VM/MVS
U UC: OS/2
L TELON DB2
PACE
T PC/TEST
A C++/MSWin
D DPS
N NAVIGATOR
T AS400
S FOCUS

COMSYS

Atlanta, Colorado Springs,
Research Triangle,
Phoenix & Washington, DC

Dept. CW
P.O. Box 7947
Gaithersburg, MD
20898-7947
Fax: 301/921-3670
800-9COMSYS

NACCB Member

DEAN, School of Information Systems and Engineering Technologies

SUNY Institute of Technology at Utica/Rome

The college, an upper division and graduate institute of approximately 2600 students, seeks a Dean for the School of Information Systems and Engineering Technology. The School currently offers baccalaureate degrees in computer and information (science and systems); engineering technologies (computer, electrical, industrial and mechanical); photonics; and telecommunications. The Institute offers an M.S. in computer and information science and is developing an M.S. in advanced technology. The School has approximately 750 undergraduate and 65 graduate students; 31 full-time and 10 part-time faculty.

RESPONSIBILITIES include promoting, developing and sustaining an environment of academic excellence, scholarship and collegial governance; providing leadership in the development of current and future interdisciplinary programs and scholarly activities, and developing relationships with industry government, and the community. Managerial responsibilities include budgeting, staffing, faculty assessment and support for both instruction and research efforts.

QUALIFICATIONS: a strong academic background as evidenced by an earned Ph.D. or equivalent degree in science, engineering or a related field; senior academic rank; tenure; and contributions to the discipline (publications, research, etc.). The successful candidate should also have considerable experience in an academic/research administrative capacity at the department chair level or above. Minority and women applicants are encouraged to apply.

For full consideration, send letter of application, vitae, and names, addresses and phone numbers of at least three professional references by January 31, 1992 to:

Mr. Anthony F. Panebianco
Director of Personnel/AA
SUNY Institute of Technology
at Utica/Rome
Drawer 91053, P. O. Box 3050
Utica, New York 13504-3050
An Equal Opportunity/Affirmative Action Employer



samarec

Saudi Arabian Marketing and Refining Company

Samarec announces openings for the following vacancies in Saudi Arabia within their Corporate Information Services Department. Applicants must have qualifications and experience as below:

SYSTEMS ENGINEER
(Systems Development Support)
BS Systems Engineering & 8 yrs related exp.

SYSTEMS ENGINEER
(Refinery Operations Support)
BS Systems Engineering or Computer Science & 8 yrs exp in program development & maintenance using IBM 4381 Mainframe. Languages: SDF, Assembler, Fortran, Cobol, CICS, Programs: MVS, MVS/XA, JCL, CICS, Rosco, TSO/SPF & Datacom DB.

SYSTEMS ENGINEER
(Applications Development)
BS Systems Engineering or Computer Science & 8 yrs exp. 2-4 yrs exp must be with D&B's Millennium Development Tools such as SDT:M, PC Link, Viewprint & PTP.

SYSTEMS ENGINEER
(Systems Development ABAPS)
BS Systems Engineering or Computer Science & 8 yrs exp. 2-4 yrs exp must be with D&B's Millennium Development Tools such as SDT:M, PC Link, Viewprint & PTP.

I.S. QUALITY ASSURANCE ANALYST
BS in Computer Science with a minimum of 10 years experience in a DP organization.

LS. PLANNING ANALYST
BS in Computer Science with a minimum of 10 years experience in a DP organization.

COMPUTER OPERATIONS ANALYST
(Capacity Planner)
BS in computer Science & 8 yrs exp in DP operations, the majority of which have been in Capacity Planning.

COMPUTER OPERATIONS ANALYST
(Performance Analyst)
BS in computer Science & 8 yrs exp in DP operations, the majority of which have been Performance Analysis.

COMPUTER OPERATIONS ANALYST
(Storage Administration)
BS in Computer Science & 8 yrs exp in DP operations, the majority of which have been Storage Administration.

SENIOR SYSTEMS ANALYST
BS in Computer Science & 8 yrs exp in DP field.

DATA ANALYST
BS in Computer Science & 8 yrs exp in DP field.

DATA COMMUNICATION ENGINEER
BSEE & 6 yrs exp in Data Communications with PC maintenance, LAN, Modems, SNA, transmission testing.

SYSTEMS ANALYST
BS in Computer Science & 8 yrs exp. 2-4 yrs working with D&B's Millennium System and HRM.

SYSTEMS ANALYST
(Dammam Info Center)
BS in Computer Science & 8 yrs exp in analysis & programs using IBM 4381. Exp with MVS/XA, CICS, Rosco/RPT & D&B's Millennium (financial systems).

LS. CHARGEBACK SUPERVISOR
BS in Computer Science or Systems Engineering & 8 yrs exp. 1-2 yrs cost accounting exp. Must know all aspects of IS Chargeback. Good oral & writing skills.

THE LESLIE CORPORATION
10700 NORTH FREEWAY, SUITE 370, HOUSTON, TEXAS 77037
FAX (713) 591-0921

A generous compensation package is offered which includes a tax-free salary, free housing, free medical, a yearly bonus and 36 to 42 days vacation each year.

Qualified applicants should submit their resume and any pertinent certificates to the address listed below within 2 weeks from the date of this advertisement. Resumes MUST include a telephone number where you can be contacted during business hours. Applications without a business hours contact number will not be considered. All applicants must be either U.S. or Canadian citizens. Send resumes to:

MIT

RESEARCH STAFF POSITIONS

Center for Coordination Science,
Laboratory for Computer Science

Join a unique multidisciplinary team developing infrastructures to support national-scale collaborative work and distributed information management applications. Projects will include supporting, extending, and generalizing the Object Lens system, a "radically tailorable" application construction tool, and other collaborative work systems. We seek:

Research Scientist/ Postdoctoral Associate

to have primary responsibility for developing major components of this system and its successors. Qualifications for this position are an M.S. or Ph.D. in Computer Science, proven programming skills, and a broad background in computer systems, ideally emphasizing networks or collaborative work tools or user interface design. Knowledge of Common Lisp and/or C is highly desirable.

Job No. R91-166

**Research Specialist/
Research Scientist** - will work as part of a collaborative project in a hands-on position, demanding balance between independent and collaborative research, design, and implementation efforts. Applicants should have a B.S. or M.S. in Computer Science or equivalent and at least 2 years of programming experience. Knowledge of Common Lisp required, and knowledge of C highly desirable. Job No. R91-165

Interested candidates are asked to send two copies of their resume referencing the appropriate job number to: Sally Hansen, MIT Personnel Office, Bldg. E19-239, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.

MIT is an Equal Opportunity/Affirmative Action Employer
MIT is a non-smoking environment

Massachusetts
Institute of Technology

Florida, Ohio, Upstate New York, Washington D.C.

C.P.U., Inc. a leading provider of value-added management consulting services to Fortune 500 companies, has openings for computer professionals with a minimum of three (3) years data processing experience. TOP salaries and fringe benefits including 401K Plan, relocation assistance, training, and tuition reimbursement.



**CORPORATE
RECRUITING
CENTER**

5360 Genesee Street, Bowmansville, NY 14026
FAX: 716-684-3669 OFC: 716-684-3667

✓

SENIOR ENGINEER Software Systems

Data Base Group position available. Duties: Conceptualize, design, code, test, and integrate data base software in support of real-time distributed data base. Develop detailed specifications and integrate these into a computer-based energy management system for electrical utilities. Data base system incorporates object-oriented and relational data modeling using an X-window based graphical user interface. Develop solutions to problems of high complexity. Make practical application of customary practices, procedures, or techniques. Requires Bachelor's degree in Electrical Engineering or Computer Science plus two years experience as a Software Engineer, or Master's degree in Electrical Engineering or Computer Science and no experience. Requires knowledge of 'C', UNIX, object-oriented data modeling, relational data modeling, distributed data base concepts, and C-windows application programming. Prevailing working conditions offered. Salary \$37,300 per year. 40 hours per week. Qualified applicants should send their resumes to: Attn: Order #FL0523757, Mr. Phil Baril, Job Service of Florida, 3421 Lawton Road, Orlando, FL 32803. EOE.

Software Development Engineer to develop, design, implement, test and debug interpreters and compilers for computer-aided software engineering productivity tools and expert system technologies for prototyping, developing, testing and maintaining (including interface code and user added code regeneration) graphical user interface applications for OS/2 Presentation Manager, DOS/Windows, and UNIX/X-Windows environments in C and C++ languages. Must have Bachelor degree and Master of Science degree in Computer Science. Three years experience as Software Engineer accepted in lieu of Master of Science degree. Education (or experience equivalence) must include academic coursework or project work in designing interpreters and compilers to implement knowledge based software engineering, expert based production system and windows programming (X-Windows) on UNIX, OS/2 and DOS Operating Systems in C and C++ programming languages. Salary: \$32,000 per annum. Must have verifiable references (2). Contact: Georgia Department of Labor, Job Order # GA 5517664, 2792 Ask-Kay Drive, Smyrna, Georgia 30082, or to the nearest Georgia Job Service Center.

Technical Analyst - Miami, FL - Responsible for anal & problem solving to improve efficiency of delivery of info through all of Co's operation systems. Designs, devops & implemts online computer application systems through the use of MVS operating system and ADSO & COBOL computer languages & devps computer systems methodologies to suppt industrial prodctn & admin functions. Devps & implements enhancements to the Interactive Restaurant Information System and Integrated Data Management System (IDMS) based upon the info systems needs of Co's operational regions. Confers with regional personnel to ascertain specific output requirements. Analyzes bus procedures & industrial operations problems to evaluate data handling effectiveness & subsequently designs & implements systems alterations to enhance industrial operations performance. Must have Bach deg in Industrial Engineering or Systems Anal. Must have 4 yrs exp in job duties or 4 yrs as Computer Systems Analyst. Exp must include util of computer languages ADSO, COBOL, operating sys MVS & dbats sys IDMS & 1 yr in fast food retail industry util Interactive Restaurant Information Comp Sys. Mon-Fri 40 hrs/wk; \$55,500/yr. SEND RESUME ONLY TO JOB SERVICE OF FLORIDA, 701 S.W. 27TH AVE. - ROOM 15, MIAMI, FL 33135. Ref: Job Order #FL 0522433.

COMPUTER PROGRESS UNITED

\$40,000 to \$60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for P/A in Kentucky, Ohio, Indiana, and Tennessee. We are the DB2 Specialist!

TELON DB2 ■ IMS ■ CICS

Send resume or call:
Computer Progress United
12730 Townpark Way
Louisville, KY 40243
(502) 245-6533

SYSTEMS CONSULTANT:

M.S. Computer Info. Sys. & documented ability req'd in use of: IBM 4956 Series/1; Event Driven Language; TSO ISPF/PDF, JCL, MVS, CICS, VSAM, CLIST, JES2, VTAM, SNA, SDLC; Protocol Converter; I/O Design for on-line systems. Provide technical support for CREDICHECK new account automated processing, CREDISWITCH transaction & CREDISAFE disaster recover systems. \$31,612/yr. Submit resume to GA Dept. of Labor, 2972 Ask-Kay Drive, Smyrna, GA 30081 or to the nearest GA Job Service Center. Control # GA 5517170

BIG APPLE OPP'S

* FINANCIAL *
NY Merchant Bank seeks Windows or OS2 Pres. Mgr Dv-lpmnt pros (\$35-70K) and C or FORTRAN PA's (\$40-55K) in a VAX VMS installation.

* DATABASE *
Brokerage Co needs Sybase, Oracle Developers (\$40-65K), DBA's (\$50-75K) and SUN Systems Admin's (\$45-80K).

* CASE *
Stable Consumer Co seeks IEF/EW/SYNON Implementors (\$40-70K) and COBOL/CICS Professionals (\$40-55K).

For personalized search of FULL TIME positions in the Metro NY area...24 hrs/7days

PHOENIX SEARCH GROUP
360 Lexington, NYC 10017
(212) 297-0512
FAX (212) 557-6749

CONSULTANTS SHOULD CONSULT

MIMI

Great Consulting Assignments and Full Time Opportunities Please send resume & call.

Mimi Simon Assoc
90 West St Suite 1105, NYC 10006
(212) 406-1705
FAX (212) 406-1768

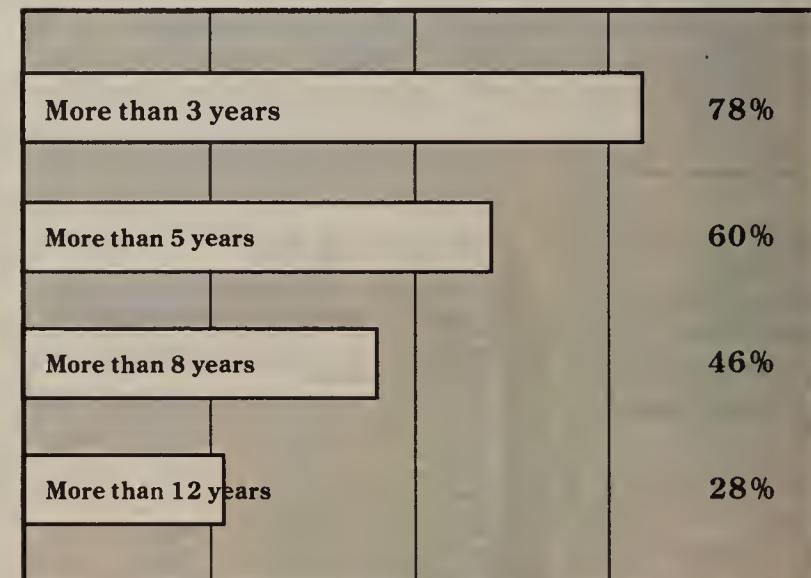
Systems Analyst to develop and maintain for telephone centers software programs for manpower planning/scheduling/tracking; develop computer aided models for decision making; custom design and develop new applications to meet specific customer needs; gather and analyze past and present data to create software concept. Requires M.Sc in Computer Science or MIS and 2 yrs in job offered or 2 yrs as Systems Analyst for manpower planning/ scheduling and/or materials; the 2 yrs to include one year using "Erlang C" and "Erlang B" formula, "Winter's Method" exponential smoothing forecast, operations research in queueing theory; and one year using Fortran/C-language, VM-OS2 and UNIX/XENIX. 40 hours per week, \$35,000 per year. Mail resume to Ms. Cathy Malo, Job Serv Prog & Tech Supp, TN Dept of Employment Sec, Nashville, TN 37245-1200; Job Order Number TN1235950.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you only qualified computer professionals.

Unlike the readers of Sunday or daily newspapers, every Computerworld reader is an experienced computer professional. In fact, the majority of Computerworld's audience has experience beyond three years. What's more, some subscribers have been reading Computerworld ever since its first issue in 1967. Simply put, Computerworld delivers far more than just job candidates - it delivers qualified job candidates.

Years in Current Job Function Reported by Computerworld's Audience of 629,204



Source: Skill Survey of Computerworld's Audience, May 1989.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



PROGRAMMER/ANALYST ORLANDO, FLORIDA

American Computer Technologies, a Contracting firm in Orlando, FL has numerous permanent and contracting assignments available. ACT seeks professionals with a minimum of two years experience in one of the following areas:

- Natural Adabas DB2
- IMS DB/DC COBOL CICS
- UNIX C INFORMIX
- OS/2 Presentation Manager
- Texas Instruments IEF
- AS ORACLE

We offer very competitive salaries and excellent benefits plus the opportunity to live and work in one of the most desirable and affordable growth areas in the country. Please mail or FAX your resume in confidence to:

ACT
Attn: Donna Shealy
1950 Lee Road, Ste. 107, Winter Park, Florida 32789
TEL 800-ACT-7185 FAX (407) 740-6023

COMPUTERWORLD

Where qualified candidates look. Every week.

Challenge Your Mind, While Experiencing A New Lifestyle.

As one of the country's top ten Blue Cross and Blue Shields, we have experienced continual growth in our Information Systems Department. If you have the talent and ambition, we have challenging opportunities for your career advancement. Our continued growth has created the need for additional Programmer Analysts with expertise in a large IBM mainframe MVS/XA environment. The ideal candidates will have 2 or more years' experience in IMS and DB2 database management. There will also be several opportunities in REI programming, data security, and disaster recovery.

We offer an exciting, progressive atmosphere, as well as the chance to live and work in one of the most desirable places in America—North Carolina's Research Triangle area. With its mild, year-round climate, you can enjoy an easy commute both to work and to our abundant recreational facilities including the Blue Ridge mountains and the sunny Atlantic coast just 2 hours away. Combining all that with a moderate cost of living, three major universities and a wealth of cultural offerings, this area presents a standard of living that's hard to surpass.

Add to this a competitive salary and a comprehensive benefits package, and you'll discover some pretty compelling reasons to reprogram your career with us.

Join our team and challenge your skills and knowledge. For confidential consideration, please send your resume with salary history to: Personnel Department/RD, Blue Cross and Blue Shield of North Carolina, PO Box 2291, Durham, NC 27702. An Equal Opportunity Employer.



Blue Cross
Blue Shield
of North Carolina



How To Build A More Powerful Future....

You and Warner Computer Systems... an alliance built on corporate growth and DP initiative.

Warner Computer Systems is a NYSE-listed leader in providing third party policy and claims administration services to the automobile insurance industry. Two things distinguish Warner: our ability to respond to and provide customized client services, and our commitment to corporate growth. Our clients regard Warner as a trusted partner, offering flexible solutions for today and for the future.

This approach requires outstanding DP talent in a variety of hardware/software arenas ranging from PC's, to minicomputers, to our new IBM ES/9000 mainframe. Positions are available for experienced applications programmers, programmer/analysts and systems analysts with a background in COBOL, CICS, VSAM and JCL, FORTRAN, C, or MICRO-FOCUS COBOL. All positions require a degree and effective communication skills.

Naturally, a leader like Warner offers competitive compensation and benefits. We offer a stimulating work environment, and a genuine opportunity to enhance your career. For confidential consideration, please forward a resumé and salary requirements to:



**WARNER
COMPUTER
SYSTEMS,
INC.**

Manager Technical Staffing
Warner Computer Systems, Inc.
17-01 Pollitt Drive
Fair Lawn, NJ 07410
equal opportunity employer

**\$ TANDEM \$
FLORIDA \$**

A HOT Market in the Sunshine

50 positions available
Consultants - Employees

* PATHWAY, TAL, TACL
* SCOBOL, COBOL, SQL

IBM

* Project Mgr./Scheduler
heavy user, vendor, exp.
* PA Expert KBMS, IDMS, C

Pinda Technologies, Inc.
550 North Reo St., Ste 300
Tampa, FL 33609-1013
Tel 813-287-5121

SENIOR PROGRAMMER ANALYSTS

Mutual Benefit Life is seeking systems professionals to incorporate new business requirements into unique and unusual applications. There are challenges in our sophisticated technical environment. We require excellent analytical and communication skills, and 2 or more years of experience with one of the following:

- * Fox Pro, LAN applications
- * COBOL with either CICS, VSAM, DB2 or CICS, VSAM or DB2, AND MVS, OS/JCL
- * COBOL (Assembler helpful) with IMS, VSAM, DL1

Join our project teams in our Individual Insurance, Pension, Corporate and Real Estate applications areas. Develop functionality in response to emerging application needs. You will use state-of-the-art tools at your PC workstation.

Enjoy our on-site health and fitness center, as well as a competitive salary and benefits package, and convenient transportation. (Sorry, no relocation benefits offered.) Please forward your resume, which must include salary requirements, to:

Human Resources, Dept. O1/AO1N
Mutual Benefit Life
520 Broad Street, Newark, NJ 07102

We are an equal opportunity employer M/F/H/V.

A Terrific Opportunity

Computer Consulting Group, has immediate openings on its consulting staff for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits. We're especially seeking:

- VAX INGRES
- DB-2
- CSP
- ACMS
- IDMS ADSO
- IMS or CICS
- RDB
- ORACLE

Computer Consulting Group

Contract Professional Services

Servicing the Research Triangle Park and the Southeast area.

4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273
FAX (803) 738-9123
Member NACCB

PROGRAMMER/ ANALYST POSITIONS

SYSTEMS PROGRAMMERS

With at least 3 years experience in

- IMS DB/DC, DL1
- NATURAL
- PL1
- DB2/SQL
- VM/MVS
- VAX/VMS
- FOCUS
- CICS
- ADABASE
- COBOL
- TANDEM
- RPGII/III
- IDMS/ADS/O
- C LANGUAGE

Please Send Resume to:

MSI
Management Solutions, Inc.
1416 South Third Street, Louisville, KY 40208
502-634-1387

PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/A's as well as systems programmers and DBA's. Fee Paid. Please call or send resume to:

Keith Reichle, CPC
Systems Search, Inc.
203 Heritage Park
Lake Wylie, SC 29710
803/831-2129

(Local to Charlotte, NC)

NEW CAREERS

MVS COBOL/CICS/DB2 PAs To \$70K
AS400 RPGII/CL PAs To \$45K
Norcross, GA • 404-446-1116
3169 Holcomb Br. Rd. #680, 30071
OS/2 and C To \$70K
IMS PAs To \$60K
Fairfax, VA • 703-222-1900
4350 Fairlakes Court, 22033
COBOL, IMS DB/DC ... \$40K
COMSHARE P/A \$45K
Memphis • 901-684-1030
4646 Poplar, #417, 38117

National Computer Associates

LEAD PROGRAMMER/ ANALYSTS

► Outstanding oppy. for Sr. P/A with 3 yrs. RPG III exp. Must have project mgmt. bckgrd. Ohio based client offers exc. benefits and career potential in new AS/400 env.
► HOGAN experience needed immed. for multiple positions in Pittsburgh, PA. State of the art env., Salary to \$50K
Call 412-864-9680 or send resume in complete confidence to: Bell Personnel, Inc., 322 Mall Blvd., Suite 178, Monroeville, PA 15146.
FAX 412-864-2319

And, so do great hospitals.

We at Inova are embarking on a major, multi-hospital information systems implementation project, signaling a new era of bold innovations in health care. With the replacement of our Patient Care, Laboratory, and Radiology computer technology with highly advanced new platforms interfacing multiple vendors, we can offer you the growth opportunity that could make your career!

PROJECT LEADERS:

- Radiology — DEC-Based, SMS system
- Patient Care — TANDEM-Based, Phamis system
- Laboratory — DEC-Based

Plan and direct implementation of new information systems, using state-of-the-art planning technology. With your excellent management and communications skills, you will set priorities, supervise and develop systems and programming staff, participate in budget management, and work directly with user teams and Inova management to ensure expected project benefits.

Requirements: 5 to 10 years hospital information systems experience, including major systems implementation experience, preferably in a multi-hospital environment. Previous radiology, patient care or other in-hospital background a strong plus. Proven leadership and analytical skills essential.

SYSTEMS ANALYSTS/ SR. SYSTEMS ANALYSTS

Make a major contribution to the implementation process, working directly with user committees to analyze complex user needs and objectives via state-of-the-art methodologies, to develop and install new systems of maximum cost-effectiveness.

Requirements: 3+ years hospital information systems experience, ideally with a background in systems implementation. Radiology or other clinical experience helpful.

Inova Health Systems is nationally recognized as a major multi-hospital force in the Virginia - Washington, D.C. area — providing outstanding health care through our commitment to innovation, quality management and staff development.

We offer excellent salaries and benefits — along with an unusual opportunity to put your career first with Inova.

Please send your resume, in confidence, to: D'Arcy Guerin, Inova Health Systems, 8003 Forbes Place, Suite 201, Springfield, VA 22151. We are an Equal Opportunity Employer.



INOVA

HEALTH SYSTEMS
A TRADITION OF INNOVATIVE CARING



"At Benson, Douglas & Associates, Inc., we believe that our employees are the backbone of our continued success."

Benson, Douglas & Associates, Inc. (BD&A) is a "total solution" systems integration firm that offers leading-edge expertise in the areas of Technical Contract Services, Project Integration Services and Business Solution Services. This approach affords challenging, long-term career opportunities for our professional staff which has allowed us to attract some of the most intelligent minds in the industry. Current opportunities require experience in:

IBM DB2/CSP, HOGAN, CICS, IMS, IDMS, SAS, ADABAS/NATURAL, FOCUS, TELON, CASE TOOLS, NETVIEW, IDEAL/DATACOM

VAX Fortran, NETWORKING, COBOL, Sys/Admin, ULTRIX, All 4GLs, C, CASE TOOLS

RDBs ORACLE, SYBASE, INGRES, INFORMIX, UNIFACE, PARADOX, Data Modeling

HP -All Platforms UNIX/C -All Platforms

Sequent C +

BD&A offers an outstanding benefits package that includes Medical, Dental, 401k and Health Club or Day Care reimbursement. If you are interested in joining our dynamic team on projects nationwide, please mail or fax your resume to: Attn: Order #FLO522753, Mr. Phil Baril, Job Service of Florida, 3421 Lawton Road, Orlando, FL 32803. EOE.

AN EQUAL OPPORTUNITY EMPLOYER

COMPUTER CAREERS

**Get
FIRST CHOICE
of new 1992 career openings**

HERE'S A PARTIAL LISTING AMONG HUNDREDS OF NEW, 1992 FEE-PAID OPENINGS

MANAGER, DEPOSITS \$85K
M&I experience required.
CASE TOOLS EXPERT EXP. MANAGER \$80K
Development and production experience
IEF (PERM & CONSULTING) \$80K
All levels: DBA, MGR. P/ANALYSTS
MVS ASSEMBLER DEVELOPER \$70K
Strong CICS or MVS internals.
ALL LEVELS HOGAN BANKING PACKAGE
Salaries to \$60K; Full relocation pkg.
MIS DIRECTOR To \$60K
AS400/COBOL. Banking.
DB2 TELON To \$60K
Knowledge of COBOL a plus.
SUPERVISOR MESSAGING SYSTEMS \$58K
Electronic mail systems.

AS/400 MFG. PROJECT LEADER \$55K
6-8 yrs. 38/400 mfg s/p experience
DOSVSE BAL PROGRAMMER \$55K
Payroll or personnel applications.
VMS APPLICATIONS & SOFTWARE \$55K
C/VMS/Sys. Svc/Util/RMS.
NATURAL 2/ADABAS P/As \$53K
2+ yrs. Natural. Ten position openings.
VAX, MF, MINI NETWORK ANALYSTS To \$51K
International assignments.
CONFIGURATION MANAGER/DBA To \$50K
VAX, VMS, DCL.
VAX ORACLE SQL \$50K
Knowledge of clinical system.
IBM RS6000, AIX, C P/A. To \$50K
Contract and permanent positions.

Contact the nearest member
of National Computer Associates—
the nation's leading network of placement
specialists—and gain immediate access to ALL of our
new 1992 hiring assignments in your field—locally & nationally!

FLORIDA PROFESSIONAL CAREERS

Immediate permanent and consulting opportunities
for professionals with any one of the following skills:

| SKILL | SALARY TO | SKILL | SALARY TO |
|---------------------|-----------|------------------|-----------|
| UNIX/C..... | 45K | HOGAN..... | 57K |
| DB2/SQL..... | 42K | M&O or MSA..... | 45K |
| CICS/COBOL..... | 39K | PMS..... | 44K |
| FOCUS..... | 45K | COMM/X400..... | 45K |
| AS 400/RPG III..... | 45K | HP 3000..... | 35K |
| TANDEM/TAL..... | 65K | INFORMIX..... | 42K |
| PATHWAY/SCOBOL..... | 55K | S/P MVS..... | 60K |
| IMS..... | 42K | ORACLE..... | 48K |
| MVS/ALC..... | 40K | VAX/VMS..... | 40K |
| IOMS/ADS0..... | 39K | WINOOWS/GUI..... | 42K |

Please mail your resume for consideration to:

| | | |
|--|---|---|
| COMPUTERPEOPLE, OEPTE, 517 2005 N.W. 62nd St., Suite 3 Ft Lauderdale, FL 33309 | 12225 28th St. N St. Petersburg, FL 33716 | 20 North Orange Ave. Orlando, FL 32801 |
| 800-777-8603 305-771-8603 | 813-573-2626 FAX 572-1153 "Serving the Tampa Bay Area" | 407-236-9706 FAX 843-8153 "Serving the Orlando Area" |



COMPUTERPEOPLE

COMPUTER DATABASE CONSULTANT. Design and develop new computer systems, and enhance existing computer systems for various clients of a large computer consulting firm, utilizing Model 204 DBMS on IBM mainframes. Analyze user requirements. Design and normalize database schemes. Using Model 204 User language design, develop and implement user interface modules for on-line queries and transaction, and batch reports. Format user-friendly terminal displays. Design and perform testing to ensure data integrity and compliance to data model. Test and debug programs at unit level during system integration. Provide technical support and consultation to project team members. Design and implement data transfer between systems using Model 204 on IBM mainframes and PC based systems. Design methods for on-line and off-line documentation of program development and modification. Most projects performed at client sites at various geographic locations. Minimum requirements: M.S. in Computer Science. Must have completed one course in each of the following: 1) Software Engineering, 2) Data Base Management Systems, 3) Systems Design, 4) On-Line Computing, 5) Operating Systems, 6) Expert Systems. Must have completed one major database management project using dBases++ or equivalent P.C. based database system. Must have six months experience in the job offered or six months experience as a Systems Analyst. Must have worked with Advanced Database Management Systems, specifically Model 204. 40 hours per week, 9:00 a.m. to 5:00 p.m., \$673.00 per week. Overtime: \$16.83 per hour. "Must have proof of legal authority to work permanently in the U.S." Send resume to the Illinois Department of Employment Security, 401 S. State Street, 3-S, Chicago, IL 60605, Attn: Joan Sykstus, Ref. #V-IL-4100-S. NO CALLS. AN EMPLOYER PAID AD.

SYSTEMS ENGINEER required. Design, configure, implement and maintain communication networks using knowledge of communication controllers, line protocols, communication protocols, as well as the following software: SNA, VTAM, APPC/APPN, SNADS, PASSTHRU, RPG/400 and COBOL. Perform system sizing evaluations and write communication programs for IBM system 38, AS/400 or PS/2. Work with operating system internals to improve performance by balancing the utilization of resources. Perform image processing including capturing and retrieving images using optical storage devices, scanners, optical disks and work folder application facilities. Applicant required to have a Bachelor's degree or its equivalent in Math, Computers, or Engineering with at least two years experience in the job duties described above. Must have proof of legal authority to work in the U.S. Annual salary will be \$48,000/year for a 40-hour work week. Interested applicants please send resume to: Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, Attn: Maxine Counts. Refer to job order number V-IL 4515C. No calls please. Ad paid by an Equal Employment Opportunity employer.

Engineer, Software. Design, develop, analyze, test & maintain network management software for Local & Wide Area Networks (LAN & WAN), including document management systems (DMS) & other inversion & search based products; develop & implement windows version of DMS; design & implement document management system for WANs. M.S. degree in Computer Science, 1+ year as Software Engineer. Experience must include document management system development for LAN and WANs, including design, testing, debugging, troubleshooting and maintenance of LAN and WAN network management software, also object-oriented, windowing interfaces and C; academic project background or software engineering or system programming experience including TCP/IP network management, database system design, ASSEMBLY, Novell Netware, Microsoft Windows, MEWEL, Xtrieve and Btrieve. \$40,200/yr.; 40 hrs./wk. Place of employment and interview: Provo, UT. If offered employment, must show legal right to work. Send this ad and your resume to: Job No. 1810185, Job Service, P.O. Box 1339, Provo, Utah 84603. The company is an equal opportunity employer and fully supports affirmative action practices.

PROGRAMMER/ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with IBM Mainframes, DB2, CICS, SPUD, ORACLE and SAS. Must have Bachelor's in Computer Science or Engineering or Math/Statistics/Economics. Experience required is two years in job offered or two years as a Systems Analyst or Management Consultant. Additionally, experience must involve use of IBM Mainframes, DB2, CICS, SPUD, ORACLE and SAS. M-F: 40 hrs/week, 8:00-5:00; salary \$36,000/year. Farmington Hills, MI location. Must have proof of legal authority to work in the U.S. Send resumes to 7310 Woodward Ave., Room 415, Detroit, Michigan 48202. Ref. No. 98691. EMPLOYER PAID AD. EOE.

Ask for your FREE
copy of our 1992 Salary Survey

National
Computer
Associates



An Environment Of Achievement.

At USAA, our people-first orientation and aggressive pursuit of advanced technology have built a 68-year tradition of achievement. Today, our team spirit, open communication and intensive "Total Quality Management" approach are creating an even stronger achievement environment for the next century.

In San Antonio, Texas, you'll discover a rich multi-cultural lifestyle that combines urban amenities, easy commuting and one of the lowest living costs in the nation. It's a great place to raise a family, and we ought to know: USAA's corporate family is one of the biggest and best in San Antonio.

NETWORK MANAGEMENT SUPPORT

- Minimum of 8 years experience with SNA
- College degree/or equivalent experience required
- Proven skills required

—VTAM/NCP Dump Debugging
—VTAM/NCP Trace Analysis
—VTAM/NCP Control and Flow
—VTAM/Programming

—LU 6.2 Development Experience
—3745s, Token Ring
—Network Performance Tuning
—Network Management Tools use
and/or development: Netview or Netmaster

Our achievement environment includes superb work and recreation facilities, innovative benefits, a four-day week and vigorous career development. There's also no state income tax! Interested candidates should send a resume to:

USAA
USAA Building
San Antonio, Texas 78288-0055
Attn: Employment & Placement/TLL/SD/CW

No agencies, please.

An Equal Opportunity Employer, M/F/H/V.

A Community For Families.

Why WTW?

Because You're The Best
Wesson, Taylor, Wells — one of the nation's premiere software consulting firms — has challenging careers across the country for top programmer/analysts with application development expertise.

ASK MANMAN

Send resume immediately or call:

Wesson, Taylor, Wells
P.O. Box 23587
Columbia, SC 29224
1-800-833-2891

WTW
SOFTWARE
CONSULTING
SERVICES

An Equal
Opportunity
Employer

CA & AZ CONTRACTS

CONSULTANTS WANTED



P. Murphy & Associates, Inc.
4405 RIVERSIDE DR., SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122
Member NACCB

TANDEM
COBOL, PATHWAY,TAL,
SCOBOL,C,SQL,X.25
STRATUS
PL1,COBOL,C,ON/2
Fulltime/Consulting Positions
available in the US/ABROAD
VAX MUMPS ORACLE IBM

STRATEM
COMPUTERS INC.

Call Irwin
800-582-JOBS
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y.10001

ARIZONA Move to Paradise!

Join us in beautiful Phoenix. We're a rapidly growing dynamic consulting company desperately seeking people with the following skills:

AIX-C
• **IMS/DB2/PC**
Call or send resume to:
Laurie Zinker
4747 N. 7th St. Ste 428
Phoenix, AZ 85014
Fax: 602-279-1161
or call
602-279-4498

**Professional Software
Consultants, Inc.**

HOGAN PROGRAMMERS AND CONSULTANTS

813-530-0207

**FARRELL AND
ASSOCIATES**
PO BOX 1678
LARGO, FL 34649

INDUSTRY CURRENTS

Insurance seeks special blend

BY EMILY LEINFUSS
SPECIAL TO CW

A mass exodus of old mainframes along with a significant influx of new technologies makes the insurance industry a hotbed of opportunity for business-savvy, forward-thinking technology experts.

"Many insurance companies are technologically backward and are being forced into major technology changes. They are upgrading very old mainframe-based systems and actively implementing new technologies in order to survive profitably through the end of the century," says David Schmaltz, supervisor of process management and control at Standard Insurance Co. in Portland, Ore. Standard provides disability, group and individual life insurance and retirement plans.

This presents career opportunities because these companies are actively looking for people who can implement better, faster and cheaper ways of using technology, Schmaltz says.

At Standard, Schmaltz is steering the company into an open systems and client/server environment by standardizing on

Unix. "Five years ago, we made a corporate commitment to move away from mainframe dominance and adopted the philosophy that says 'appropriate is beautiful.'

Other insurance companies are also moving away from traditional mainframe-based technology and skills because of the high overhead in hardware and personnel, Schmaltz says. These companies are moving toward midrange computing and local-area networking. "The economies of working in a mainframe environment are gobbling up profits in the industry," he says.

Leading edge

Because of the industry's transitional phase, professionals who understand the outgoing mainframes, the incoming technologies and the overall business will have an edge over those people who are just technologists.

"IS people need a strong understanding of the business as well as a strong understanding of technology to broker the technology to the business, to find

those aspects of technology most effective for improving productivity and the bottom line," says Peter Daboul, senior vice president at Massachusetts Mutual Life Insurance Co. in Springfield, Mass.

New technologies providing job opportunities at Mutual Life include a large computer-aided software engineering (CASE) in-

stallation, LANs and fledgling efforts into expert systems and image processing, Daboul says.

Advanced technology is a promising career path in insurance companies, which are looking to new

technology to improve productivity and profitability, says Chick Bisberg, president of Two-Party Systems, Inc., a recruitment firm in Livingstone, N.J.

"These technological areas have pragmatic and cost-effective use, not simply by enhancing the way a company does business but by eventually lowering the costs of computing," Bisberg says.

Bisberg includes a wide range of technologies under that ru-



bri: artificial intelligence, CASE tools, laptop computers, pen-based computers, networking, client/server environments, open systems and object-oriented programming. Just about all of these areas hold career opportunities for those who can be effective implementors.

Another big payback area for the insurance and financial services industry is in imaging and image processing because those industries are paper-intensive, Daboul says.

Backing this up is market research that says insurance firms accounted for 18% of all document image processing systems in place in 1990 — the largest of any market segment, according to International Data Corp. in Framingham, Mass.

Expert systems are also being tested in insurance companies, Bisberg says. "Most insurance companies are trying to get beyond using expert systems to assist the claims adjuster or broker and move them into the design of the next generation of systems. Then the expert system not only increases the speed of the processing and inputting of information but upgrades the expertise level of the individual using the system," he says.

While productivity and profitability are significant for insur-

ance industry investments in new technologies, service improvement is also a driving force.

"Our industry has been known for not giving very good service, and the trick for IS professionals is to improve service without driving costs up," says Edward Flitz, vice president of information services at Northwestern Mutual Life Insurance Co. in Milwaukee.

Achieving service improve-

THE TRICK FOR IS professionals is to improve service without driving costs up."

EDWARD FLITZ
NORTHWESTERN MUTUAL
LIFE INSURANCE

ment without incurring unacceptable costs requires a special ability to integrate old and new, according to Flitz. "We have more technologies in place than we have ever had before, and we can't just drop the old host-based systems, either. We all have 20- to 30-year-old systems, and now, with the new client/server, PC-based technologies busting in on us, we also have to move into that world."

Leinfuss is a free-lance writer based in Sarasota, Fla.

LOOKING FOR THE BEST!!!

Tekmark Computer Services, Inc. has Superb, State of the Art Assignments at Excellent Rates!!!

NY NJ CT PA MD

- X-Windows
- Microsoft Windows
- Motif
- SQL Servers
- Open Look
- UNIX/C or AIX
- Sybase
- UNIX Internals
- ORACLE
- C Programmers

TEKMARK
Computer Services, Inc.
100 Metroplex Drive, Suite 102, Edison, NJ 08817
(908) 572-5400 (212) 686-9360
FAX (908) 572-7117

If You've Got What It Takes CALL US!

PROGRAMMER/ANALYST

\$2,617 - \$32,310 annually hiring range DOQ

Forty (40) semester hours post high school coursework in computer science, management information systems or related field and two (2) years of progressively responsible work experience in programming and two (2) years of analysis or any combination of education, training or experience which demonstrates the ability to perform the duties of the position. Experience in RPG II, RPG400 and COBOL, IBM SYS/36 and AS/400 preferred.

APPLY BY: Immediately (position will remain open until suitable candidate is selected). County of Yuma Application is required & may be obtained by contacting:

Yuma County Administrative Services
198 S. Main Street, Yuma, AZ 85364
Phone: (602) 329-2115 FAX: (602) 329-2001
Equal Opportunity Employer/AA/MFH

JOIN SEATTLE'S BEST IN '92"

D P Professionals with a desire to "MAKE A DIFFERENCE" owe it to themselves to explore career opportunities with BUSINESS ENTERPRISE SYSTEMS and TECHNOLOGY, INC. (BEST).

BEST is building the premier consulting and contracting firm in the Northwest. The key to achieving this vision is YOU, a committed professional in an environment where you are empowered to make a difference with our clients and in BEST's own development.

Rapid growth is generating ongoing needs in the following:

- Windows
- DB2
- CSP
- INTERGRAPH
- AS/400
- DCS
- C/C++
- SYSTEMATICS
- ARC/INFO
- M&D
- PACBASE
- HOGAN
- ISI
- STRATUS
- TANDEM

We offer competitive salaries, benefits, profit sharing and EQUITY potential. Invest a few minutes for a potential long term return. Call or send resume to:

BUSINESS ENTERPRISE SYSTEMS and TECHNOLOGY, INC.
Anne Story, 1940 116th Avenue N.E., Bellevue, WA 98004
(206) 637-0130 FAX (206) 637-9550

FOR WINNERS ONLY!

Now is the time to enhance your career... Our clients have new and exciting openings for the following skills:

- DB2 — Data Modelers & DBA's
- DB2 — Application Programmers and Designers
- IMS — Application Programmers

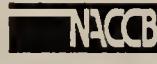
For consideration, send resume or call:
TECHNOLOGY CONSULTING, INC.
2020 Meidinger Tower, Louisville, KY 40202
(502) 589-3110 FAX (502) 589-3107
MEMBER NACCB

PROFESSIONAL CONSULTING NETWORK**SAN FRANCISCO BAY AREA****SPECIALIZED CONTRACTS IN**

| | |
|-----------|-------------------|
| MSA | McCORMACK - DODGE |
| PEOPLESOF | TESSERACT |
| INGRES | ORACLE |
| SYBASE | ACP/TPF |
| S/W 2000 | TOLAS |

P/As, DBAs, Modelers, Analysts, S/Ps

595 Market Street, Suite 1400
San Francisco, Ca 94105
(415) 777-4321 • Fax 777-8632

**SENIOR DBA**

\$3,811 - \$4,632 MO

Supervises and participates in a variety of complex technical work in the development, operations, maintenance, and use of DB2 relational data bases and data dictionary facilities on IBM mainframe. Requires four years of experience in DB2 relational data base installation, performance and tuning, analysis and design. Supervisory experience and Bachelor's Degree in computer science information systems or equivalent experience or closely related field preferred. Would like to have person in place by the first quarter of 1992. Submit standard City application and supplemental application by 5PM Tuesday, December 31, 1991 to:

City of Sacramento Personnel Dept., 921 10th Street, Room 101, Sacramento, CA 95814, Office hours M-F, 8-5 or call (916) 449-5726. AA/EOE

GO WITH A LEADER FOR CHALLENGE, REWARDS... IN A HIGHLY SOPHISTICATED ENVIRONMENT!**Opportunity in Greenville, South Carolina**

With products that rank as the #1 consumer's choice, Michelin Tire Corporation is the preeminent leader in tire technology and manufacturing. Our commitment to quality prevails throughout our dynamic organization, motivating our team of professionals to new levels of accomplishment. If you're interested in meeting the challenges of our fast-paced, highly sophisticated MIS operation, consider this immediate opportunity:

SR. DATABASE ANALYST

To qualify, you must have a four-year degree, 3+ years technical experience in IDMS-DB/DC, IDMS DATABASE and System Utilities, and background with OS-JCL, VSAM, TSO/SPF and ANSI COBOL and IDMS database administration.

Experience with Cullinet applications software, DBMS

DBA and developer toolkit experience, DB2 or SQL/DS, and ADSA, ADSG, and OLM would be a definite asset.

If selected, you will be involved in working with applications development groups in the use of a modification of Cullinet application databases and software; physical database design and implementation; installing Cullinet applications software; and supporting large-scale database systems.

Michelin offers a highly competitive compensation and benefits package, along with the support and development you need to reach your professional goals. For confidential consideration, please send your resume with salary requirements to: Personnel Department, Michelin Tire Corporation, P.O. Box 19001, Greenville, SC 29602-9001. An equal opportunity employer.



MICHELIN
PUTTING CAREERS IN MOTION.™

**"At Aetna,
we're using
advanced
systems
technology
to gain
strategic
business
advantages."**

*Systems Consultant
Aetna Information Technology*



SuperHackers

D. E. SHAW & CO. is a small (several dozen employees), highly capitalized (over \$300 million in partners' equity), extremely successful Wall Street firm specializing in quantitative finance and computational trading. Our technical staff includes both Ph.D.-level researchers recruited from Stanford, MIT, and other leading computer science departments and extraordinarily talented B.S.-and M.S.-level system designers and "superhackers". It is our practice to compensate unusually gifted individuals at a level exceeding that of the market. Applicants are invited to send resumes to Ms. Jennifer Strulson.

D. E. SHAW & CO.
39th Floor, Tower 45
120 W. 45th Street
New York, NY 10036

★ GET OUT ★ OF TOWN NATIONWIDE OPPORTUNITIES

YOUR HOME TOWN MAY HAVE MANY JOBS, BUT NOT YOUR CAREER OPPORTUNITY. THE COMPUTER-TECH NETWORK OF 60 NATIONAL COMPUTER SEARCH AGENCIES SPECIALIZES IN THE PLACEMENT AND PAID RELOCATION OF COMPUTER PERSONNEL TO ALL AREAS OF THE U.S.A.
(216) 356-9990
FAX # (216) 356-9991
TOLL-FREE 1-800-752-3674
COMPUTER TECH NETWORK
21010 Center Ridge Rd.
Rocky River, Ohio 44116

ADVANCED SYSTEMS CONSULTANTS

At Aetna, our commitment to technology is reflected in our advanced state-of-the-art systems environment and our continual growth in this area. Right now, we have challenging opportunities for three systems professionals at our Middletown facility.

ELECTRONIC TRANSACTION PROCESSING PROFESSIONAL

You'll deliver Information Technology solutions that will collect information from employee benefit health care service transactions and automatically determine, record and initiate settlements.

You'll need 8-10 years' demonstrated experience in systems development, with emphasis in complex, high volume (1+ million) on-line transaction processing systems, including architectural design. Bachelor's degree (or equivalent) in Computer Science preferred. You must be a progressive thinker in business analysis, with the ability to match business opportunities to technical solutions.

The following positions require proven experience in IEF environmental support, information engineering lifecycle management, project management methods and techniques, metrics and quality assurance.

PROJECT CONSULTANT

You'll provide full lifecycle application delivery technology expertise and consulting services to support application development teams. This will include assisting in the development of implementation plans, reviewing deliverables for compliance and quality, and ensuring projects remain on schedule.

A B.S. in Computer Science or Business is required along with a minimum of 5+ years' experience with advanced technologies and systems development process. This experience must include at least 3+ years with structured development methodologies and CASE tools, preferably IEF, and 3+ years in leading an application delivery project.

LIFECYCLE MANAGEMENT

You'll support the establishment and implementation of systems engineering methods and standards as well as the introduction of project management techniques to ensure rapid and accurate systems delivery.

You must possess a B.S. in Computer Science or Business along with a minimum of 5+ years' experience in systems development, 3+ years in methodologies, standards and project management techniques, and 2+ years in CASE tools and Information Engineering implementation.

We offer an excellent salary, generous comprehensive benefits, unique professional challenges and opportunity for advancement. For immediate consideration, send 2 copies of your resume, indicating position of interest, to: Aetna, Staffing, MAA3, Dept. 2724B, 1000 Middle Street, Middletown, CT 06457. No agencies or phone calls, please. Aetna is an Equal Opportunity, Affirmative Action Employer.

A policy to do more.

L.L. Bean, the nationally known, New England-based retail and catalog merchandiser of outdoor sporting equipment and apparel, is once again, expanding its data resource management function. We are looking for experienced professionals to contribute to our roll-out of information engineering approaches and to the implementation of key corporate information bases. We seek candidates for the following:

Data Analyst

Position requires 6+ years in the Information Services field, with at least 2 years in data administration or business systems analysis and design. A strong business orientation and experience in logical data modelling are required; experience with CASE tools is preferred. Excellent interpersonal and communications skills are essential. The ability to facilitate JAD sessions as well as project management experience are highly desirable.

Data Base Analyst

Position requires 6+ years in the Information Services field, with in-depth experience using a relational database management system. Experience in physical database design through application development or database administration positions, excellent interpersonal and communications skills, understanding of logical data modelling and experience with CASE tools are all essential. DB2 experience is a plus.

L.L. Bean offers competitive compensation packages. To be considered, please send a cover letter, salary requirements and resume, to: **Paul A. Collet, Sr. Staffing Specialist, L.L. Bean, Inc., Casco Street, Freeport, Maine 04033**. Only cover letters stating salary requirements will be considered. An equal opportunity employer.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

For over two decades, Computerworld has delivered qualified job candidates to America's employers.

And ever since Computerworld's first weekly issue in 1967, America's companies have relied on Computerworld to target America's most qualified computer job candidates.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700)**.

POSITION WANTED

DB2 SPECIALIST

German DB2 Specialist, willing to become US citizen, is experienced in logical and physical data modelling, tuning, system analysis, requirement definition, application and system programming with COBOL, PL/I and Application System in MVS/XA and ESA environment. Looking for freelance/career opportunities.

Please call (49) 40 693 07 38 or write to Ingo Mueller, Barenbeck 23, D-2000 Hamburg 71, Germany.

COMPUTERWORLD

Where qualified candidates look. Every week.

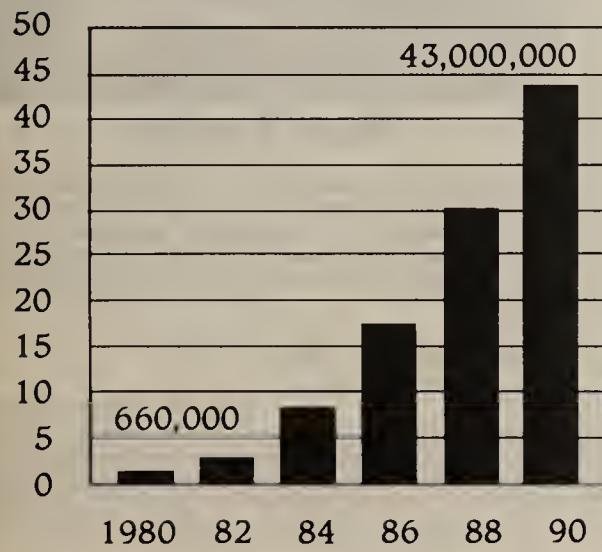
If you recruit computer professionals, we have their numbers.

We've probably spent more money researching this market than any company in America. And what we've learned can help you.

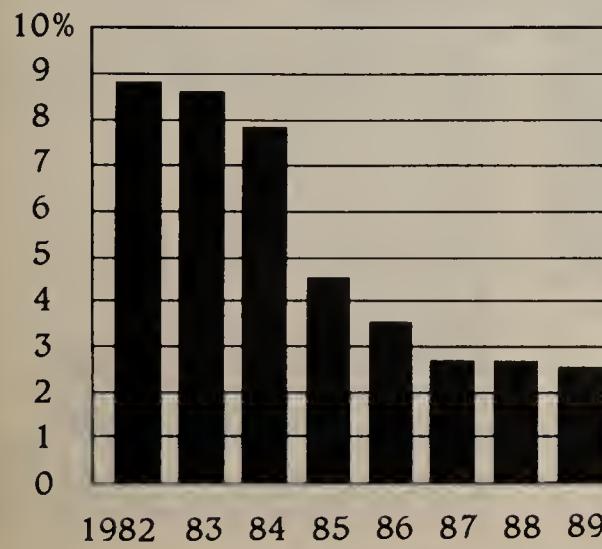
Number of computers up 6,415% in 10 years.

At this pace, how will you meet the demand for staff in the future? One

More computers are demanding more talent*



Fewer campus freshmen are choosing computer careers**



source is America's campuses. But with college freshmen interest in computer careers dropping more than two-thirds since 1982, you'll need to find other sources. Call us. We'll tell you about them.

Only 20% of computer professionals actively seek jobs through sources like local classifieds.

Which, according to figures from our annual Job Satisfaction Survey, leaves 80% of the market largely unreachable through local papers. Yet easily reached through professional newspapers. Our research can show you how.

Over 213,000 professionals with CICS operating system experience are reachable with a single advertisement.

And so are hundreds of thousands of others with skills from DB2 to IBM S/38 to Unix. How? Call us and we'll show you.

Computerworld reaches professionals with key skills - a few examples from our survey-

| Skill/Product | Product type | Experts in Computerworld's Audience |
|----------------------|------------------|-------------------------------------|
| IBM PC compatible | hardware | 523,573 |
| IBM (all but PC) | hardware | 488,965 |
| Digital Equip. Corp. | hardware | 214,375 |
| MVS | operating system | 257,248 |
| Cobol | language/utility | 443,166 |

Free reports!

Our skill survey reveals demographics.

Computerworld just completed a major survey of computer skills among its readers. The results can help you target your recruiting. Call John Corrigan at **Computerworld** for your free report.

We conduct the most comprehensive salary survey in the field.

Co-sponsored by the Data Processing Management Association, the annual report is available to you at no charge.

If you want to check out our numbers, just call us at this one: 800/343-6474 (in MA, call 508/879-0700). Ask for John Corrigan, Classified Advertising Director. Or write to him at Computerworld, Department N, 375 Cochituate Road, Framingham, MA 01701.



COMPUTERWORLD

Where the qualified candidates look. Every week.

Sources: *International Data Corporation **American Council on Education

PRODUCT SHOWCASE



KEYCAP ENGRAVING

Servicing the Computer Industry
FAST and ACCURATE
We Make Our Own Masters
Special Languages & Symbols
Prototypes & Volume Engraving
Over 20 Years Experience

Bryants Engraving
Service

830 Clay Street
Winter Park, FL 32789
1-407-644-9790

UNIX in Minutes!

Eliminate the Unix Learning Curve

THE ULTIMATE UNIX TOOLBOX

PinPoint™ PinQuik™

- Makes UNIX easy for the end user
- Automated UNIX Commands
- Menu Builder
- Safety Net
- Available in AIX

* 30 DAY MONEY BACK GUARANTEE *

WRITE:
PRO/SIM™
14201 Memorial Drive, Suite 4
Houston, TX 77079

CALL TO ORDER or FAX:
1-713-558-6866
FAX: 713-558-8857



WORRIED ABOUT COMPUTER RADIATION?

So are your employees & customers!!!

The Tracer Meter will effectively measure, in an easy to use manner, your computer and office equipment's levels.

- Quantity discounts available
- Reseller opportunities
- Dealer Inquiries Welcome
- Price only \$795.

P.C.S.
800 Village Walk, Suite 158
Guilford, CT 06437

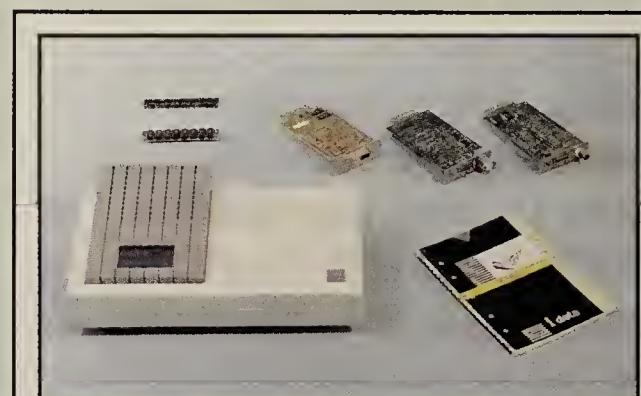
1-800-888-1515
(Ext. 5505)
Fax: 203-453-0505



BalancedPower Plus® - 'Intelligent' UPS

Software controlled UPS for fast response, tight control, longer battery life, cleaner output waveform. Integrated 10-30k VA unit (shown) has batteries and panel board in UPS cabinet. Other models 15-150kVA.

International
Power Machines 1-800-527-1208
2975 Miller Park North
Garland, TX 75042
Fax: 1-214-494-2690



idaPDS AFP/IPDS protocol converter for any HP LaserJet printer.
• IBM 4028, 3812 and 3816 plug-compatible
• All IPDS towers supported, 32 resident fonts
• Lightning fast RISC-based technology
• Intelligent IBM host/PC or PC network print share
• Multi-environment support

i-data, Inc.
19 Walt Whitman Road
Huntington Station
New York, 11746
1-800-432-8246
Fax: 1-516-351-1273



AutoTester

Developer and distributor of the most unique and widely accepted automated testing technology of the '90s. Discover how a structured approach to automated testing will dramatically improve the quality of your software while reducing the resources devoted to testing.

AutoTester, Inc.
6060 N. Central Expy
Suite 670
Dallas, TX 75206

1-800-328-1196

4 COLOR PHOTO or Graphic

PREFERRED 4-COLOR MATERIALS: 4-color negatives, right reading emulsion side down. Acceptable also (in order of preference to maintain optimum reproduction quality) are: 4-color transparencies; 35mm color slides; color photos.

If 4-color artwork is not available, Computerworld will assist Product Showcase advertisers in the development of appropriate graphics for their advertisements. Ad width: 3", Ad Depth: 3 1/2". Photo width: 2 3/4"; Photo depth: 1 3/4".

Name Of Your Product

This is a sample listing in Computerworld's new Product Showcase Section. This is a sample listing in Computerworld's new Product Showcase Section. This is a sample listing in Computerworld's Product Showcase Section. This is a sample listing in Computerworld's Product Showcase Section.

ABC Company
123 Main Street
Anytown, USA 12345

1-800-XXX-XXXX

Place Your Product In COMPUTERWORLD'S PRODUCT SHOWCASE!

For just \$2,700, your product can appear 3 times in COMPUTERWORLD's PRODUCT SHOWCASE. To place your message, or for more information, just fill out this form and fax it to (508) 620-7739. Or place your advertisement by calling (800) 343-6474 (in MA, (508) 879-0700).

I'd like more information

I'd like my product to appear in the Product Showcase

Headline (approximately 1-6 words): _____

Text (approximately 3 medium length sentences):

Name of Company: _____

Address: _____

City, State, Zip: _____

Phone: _____

COMPUTERWORLD

PRODUCT SHOWCASE

(800) 343-6474

(in MA, (508) 879-0700)

MARKETPLACE

Superstores: Appeal of in-stock bargains

BY ALICE LAPLANTE
SPECIAL TO CW

At Genelabs, Inc., a Redwood City, Calif.-based medical research firm, MIS Director Bruce Hallberg routinely shops for microcomputer hardware, software, peripherals and components at the local CompUSA, a computer superstore that recently opened a branch in the San Francisco area.

"We started going there because of the excellent selection and availability of parts and components, but that quickly blossomed into buying CPUs as well because of their low prices," Hallberg says.

Yet choosing to go to a superstore over a traditional personal computer retailer such as Computerland Corp. or Microage, Inc. can have its drawbacks — specifically in the service and support arena, he says. The fact that Hallberg has sophisticated in-house repair expertise and facilities makes that less of an issue for him than for other information systems managers. Superstores "are reasonably competent, but I wouldn't trust them with complex connectivity issues, for example," he says.

Superstores are currently the fastest growing segment of the PC hardware and software distribution channel as national chains such as Dallas-based CompUSA, Columbus, Ohio-based Micro Center and Austin, Texas-based Compuadd Corp. continue to spring up around the country.

There are approximately 70 superstores open nationwide, es-

timates Seymour Merrin, president of Palo Alto, Calif.-based Merrin Information Services, Inc., a consulting firm that tracks the PC distribution channel. About half of those opened in the last 12 months, and Merrin says he expects that number to more than double — to 185 superstores — by the end of 1992.

Take-home bargains

A superstore is defined by three components: low prices, which range from 30% to 80% of retail; a broad selection of products that represents almost 10 times what is on display at traditional retailers; and immediate availability. This latter element is key: Unlike traditional retailers, with which companies place an order and can wait days or weeks for product delivery, with a superstore, what you see is what you get, Merrin says.

Most computer superstores have at least 25,000 sq ft of space, with at least 5,000 separate products on display and in stock, he adds. A retail store will have only 600 or 700 products on display, at most, Merrin says. For those IS managers who measure service in terms of getting what they want when they want it, superstores are a boon.

However, it can be difficult for superstore employees to be fully versed in everything they must sell, IS managers say. And although superstore technicians may be qualified to configure and install stand-alone machines, an

enterprisewide network is another matter.

"Pricing is obviously a concern in these budget-crunching times, but as far as LAN integration and support services — which is really what we require at the present time from our vendors — superstores don't have the necessary expertise," says Dawn Kroll, a buyer at Manufacturers Hanover Trust Co. in New York, which lately has turned to network integrators for PC hardware, software and services because of the complex nature of the technology.

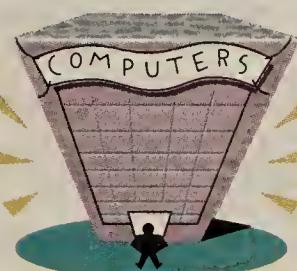
Many firms don't have extensive in-house repair experience or facilities, which deters them from buying from superstores.

Bob Badolato, a senior data processing specialist at Plymouth Rock Assurance Corp. in

Boston, says his firm still buys its PC hardware and software from traditional dealers because of the limitations of his in-house support staff. "I would only go to a superstore if I had my own in-house technicians to do repairs — which I don't," Badolato says.

Even Hallberg does not depend solely on superstores for his firm's PC needs. Indeed, the way he acquires hardware, software and services reflects a growing trend: IS managers who shop around at a variety of different vendors in order to get the right mix of price, availability and technical expertise.

"For high-end products, like



file servers and networking services, I'll go to a dealer," Hallberg says.

Another drawback to superstores is the fact that most do not sell IBM or Compaq Computer Corp. machines — a serious deterrent to firms that have standardized on these vendors.

"We're an IBM shop, which doesn't allow us to go someplace that doesn't sell IBM," says Jim Bell, manager of business planning at Occidental Chemical Corp. in Dallas.

"If I need to buy a Compaq machine, I obviously can't go there," says Mike Cunningham, MIS director at Dr Pepper/Seven-Up Cos. in Dallas. But he says he does buy all his disk drives, add-in cards, power supplies and other components from superstores.

"Dealers would make you go through their parts departments to get these items and mark them up 200% rather than discount them 30%," Cunningham says.

However, retail outlets that had IBM or Compaq authorization prior to turning into superstores — like Micro Center — retain the rights to sell those machines. Apple recently authorized CompUSA to sell its product line. And Compaq says that although it has not yet authorized CompUSA or other superstore chains to carry its products, it is "currently in discussion," Compaq spokesman Kevin Sweeney said.

Still, the low prices — ranging from 40% to 80% off retail —

and the immediate availability of products can sometimes outweigh the inconveniences.

Cunningham says instant gratification is the essence of what good service should be — and what most traditional dealers so rarely provide. "Service means getting your hands on what you need *immediately*," he says, adding that he shops at local superstores for this reason.

DEALERS WOULD make you go through their parts departments to get these items and mark them up 200% rather than discount them 30%."

MIKE CUNNINGHAM
DR PEPPER/SEVEN-UP

Some IS managers say that although the technical expertise and the level of service and support provided by superstores represents the bare minimum, in practice it doesn't differ that much from what traditional retailers currently serve up.

"In my lengthy, battle-scarred experience, any kind of retail store — even the larger organizations — doesn't provide any service and support worth mentioning, so why worry about losing it?" asks Philip Gordon, manager of the information center at Charles Schwab Corp. in San Francisco.

"Due to shrinking margins, the dealer channel isn't providing that much service and support anyway," Merrin agrees.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Buy/Sell/Lease

**Specializing in:
EDX TO AIX
MIGRATION**
Series/1 to
RS/6000
Migration
Services
**RT
4300
9370
AS/400
RS/6000
SERIES/1
SYSTEM 36/38**
BUY SELL LEASE
CALL 612-942-9830
DATA TREND Inc.

10250 Valley View Rd. Suite 149, Eden Prairie, Minnesota 55344

IBM SPECIALISTS
AS/400 • SYS/3X
BUY • SELL • TRADE • LEASE
UPGRADES • FEATURES • PERIPHERALS
NEW AND USED
IBM MAINTENANCE GUARANTEED
ON STAFF TECHNICIANS
IBM COMPATIBLES:
PERLE CONTROLLERS • AI MEMORY
LYNK DISPLAY STATIONS • BEST UPS
CMA
COMPUTER MARKETING
of America, Inc.
800-251-2670
610 BRYAN ST. • P.O. BOX 71 • OLD HICKORY, TN 37138
IN TN (615) 847-4031 • FAX (615) 847-5739

**SYSTEM 36/38
4300
SERIES 1
SYSTEM AS/400**
Trade Lease
* SPECIAL LEASE RATES ON AS/400'S
• Buy • Sell • New • Used
• Flexible Lease Options
• Tailored to Your Needs
• Printers • Tape
• IBM Warranty/IBM
• Maintenance Guaranteed
• Disk • Terminals
• Equipment Configured
To Your Requirements
• All CPU Upgrades
NEWPORT LEASING, INC.
(800) 678-9426
2943 Pullman St., Santa Ana, CA 92705-5818
714/476-8176 • FAX: 714/478-9200
IBPL is a registered trademark of IBM Corp.
INTERNATIONAL BUSINESS MACHINES CORP.

CLASSIFIED

Buy/Sell/Lease

DEMSEY.
WHERE IBM® QUALITY IS
SECOND NATURE.

- SERIES/1
 - 9370
 - RS/6000
 - INDUSTRIAL PC
 - ES/9000
 - AS/400
 - SYSTEM 36/38
 - POINT OF SALE
 - BUY-LEASE-SELL
 - Processors
 - Peripherals
 - Upgrades
- For pretested equipment, flexible financing, configuration planning, technical support and overnight shipping call

(800) 888-2000.

Dempsey
BUSINESS SYSTEMS

Where IBM Quality is Second Nature
18377 Beach Blvd. Suite 323 • Huntington Beach,
CA 92648 • (714) 847-8486 • FAX (714) 847-3149

IBM is a registered trademark of International Business Machines Corporation

IBM

Authorized
Distributor Product
Integrator

UNIX * MOTOROLA * UNIX

GET THE BEST IN UNIX
SYSTEMS

MOTOROLA COMPUTERS

FROM

AMES SCIENCES

301-476-3200



MOTOROLA
Computer Group
Authorized Reseller

VAR INQUIRIES WELCOME

WE
Buy - Sell - Lease
New and Used IBM Equipment
AS400 - System 36, 38, 43XX
SHORT TERM RENTALS

Call 800-238-6405
IN TN 901-372-2622

as
CDI MEMBER
AMERICAS SOCIETY OF COMPUTER DEALERS

COMPUTER BROKERS, INC.
2978 Shelby St., Memphis, TN 38134
"Since 1974"

9370/9221?

EXECUTIVE INFOSOURCE!

BUY
SELL
LEASE
IN STOCK

TELEPHONE: (708) 215-9370

FAX: (708) 215-9992 CDI MEMBER
Computer Dealers & Lenders Association

Bids/Proposals/Real Estate

MS CENTRAL DATA PROCESSING AUTHORITY
Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg. Suite 508, Jackson, MS 39201 for the following:
RFP 2095, due Thurs., 1/2/92 at 3:30 p.m. for a twenty station LAN upgrade for the OFFICE OF THE SECRETARY OF STATE.
RFP 2101, due Thurs., 1/2/92 at 3:30 p.m. for thirty (30) workstations for Office Administration of NORTHEAST MISSISSIPPI COMMUNITY COLLEGE.
RFP 2103, due Thurs., 1/2/92 at 3:30 p.m. for a Local Area Network consisting of a server, 20 workstations and software for MISSISSIPPI STATE UNIVERSITY.
Kelli Brown @ (601) 359-2604

Classified Marketplace

needs only 3 days notice to run your ad! Call:

(800) 343/6474
(in MA: 508/879-0700)

SPECTRA

A full line IBM, Digital and Xerox dealer

(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX

IBM®

ES/9000, RISC/6000
9370, 4381
AS/400, S/36, S/38
Series/1
S/88, STRATUS
Point of Sale
Banking
CAD/CAM

digital®

VAX 8000
VAX 6000
VAX 4000
MicroVAX
PROCESSORS
PERIPHERALS
UPGRADES

XEROX®

9790
8790
4090
4050
4045
3700
BUY
SELL
RENT
LEASE

Authorized Digital & Xerox distributor

ANAHEIM CORPORATE CENTER 5101 E. La Palma Ave., Anaheim California 92807

WE BOUGHT IBM®

By the thousands.

As a result of our thousands of purchases of new and used IBM systems of all sizes, shapes and descriptions, we are offering you great savings on IBM AS/400's, 36's, tapes, drives, printers and peripherals, as well as all upgrades.

As a specialty, we offer multiplexors, modems, protocol converters and PS/2's.

If you have a need to buy or sell, call us first and DEAL DIRECT with the...

COMPUTER MARKETPLACE

800-858-1144

In CA dial (714) 735-2102, 205 East 5th Street, Corona, CA 91719

IBM is a registered trademark of International Business Machines Inc.

New/Reconditioned
digital
Equipment

Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC maintenance.

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Compurex Systems, Inc.
83 Easton St.
Easton, MA 02334
Call Toll-Free
1-800-426-5499
In Mass. (508) 230-3700
FAX (508) 238-8250

Prime

Experienced Systems
New & Used
Peripherals
Worldwide Service

Buy - Sell - Lease
OTW, Inc.
305 Union St
Franklin MA 02038
508-520-0250

COMPUTERWORLD
CLASSIFIED
MARKETPLACE

Examines the issues while computer professionals examine your message.

Call for all the details.

(800) 343-6474
(in MA, 508/879-0700)

HP HP HP HP

NEW and USED
1000 • 3000 • 9000
Including Spectrum

BUY • SELL • TRADE • RENT • LEASE
Processors • Peripherals • Systems

All in Stock - Immediate Delivery
All warranted to qualify for manufacturer's maintenance

ConAm Corporation

It's Performance That Counts!
800/926-6264 213/419-2200
FAX 213/419-2275

IBM

BUY • SELL • LEASE

4381 • 3725/3745 • 3380 • 3480

- All peripherals
- Feature Work
- IBM MAQ
- Upgrades

Salem Computer Group

(800) 727-5999

CDI Member
Computer Dealers & Lenders Association

Fax (919) 661-3400

The BoCoEx index on used computers
Closing prices report for the week ending November 22, 1991

| | Closing price | Ask | Bid |
|----------------------|---------------|---------|---------|
| IBM XT Model 089 | \$375 | \$450 | \$375 |
| AT Model 099 | \$500 | \$525 | \$475 |
| AT Model 239 | \$550 | \$650 | \$500 |
| AT Model 339 | \$750 | \$1,000 | \$700 |
| PS/2 Model 30 286 | \$750 | \$900 | \$700 |
| PS/2 Model 60 | \$900 | \$1,500 | \$900 |
| PS/2 Model 80 | \$2,250 | \$2,600 | \$2,150 |
| PS/2 Model 90 | \$4,300 | \$4,600 | \$4,100 |
| Compaq Portable II | \$500 | \$650 | \$475 |
| Portable 286 | \$900 | \$1,000 | \$800 |
| Portable 386 | \$1,800 | \$1,900 | \$1,500 |
| SLT 286 | \$1,200 | \$1,300 | \$1,000 |
| LTE 286 | \$1,000 | \$1,300 | \$900 |
| Deskpro 286 | \$800 | \$1,000 | \$700 |
| Deskpro 386/20 | \$2,000 | \$2,300 | \$1,900 |
| Apple Macintosh Plus | \$750 | \$975 | \$700 |
| SE | \$950 | \$1,050 | \$950 |
| IIX | \$3,100 | \$3,350 | \$3,000 |
| IICI | \$3,500 | \$3,800 | \$3,400 |
| IIFX | \$4,600 | \$4,900 | \$4,400 |

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

AS/400 9370

CPU's, Features, Upgrades & Parts for
Immediate Delivery. Installed by our
Engineers or Yours. All Hardware
Tested & Certified for
IBM Maintenance.
800-553-0592

IN MN 612-931-9000
FAX 612-931-0930
12800 WHITEWATER DR.
MINNETONKA, MN 55343

WORLD DATA PRODUCTS

CDI Member
Computer Dealers & Lenders Association

Software

pcTrack**HELP DESK
AND PC
INVENTORY**

An elegant, low-cost PC based tool that integrates user support, analysis and computer asset mgmt. Available in stand alone and LAN environment.

416-282-3477

Free Demo Copy
PC-SOFT Inc.

KeyEntry III**PC-BASED DATA INPUT SOFTWARE****REPLACE DEDICATED DATA ENTRY SYSTEMS
FRONT-END MAINFRAME APPLICATIONS**

- LAN or stand-alone environments
- Two-pass verification
- Batch balancing and check digits
- Operator statistics reporting
- Embedded-numeric key-pad emulation
- Extensive field edits and table lookups
- Screen Painter and MenuManager included
- Batch Control System and Reformat utility
- User-definable help screens and windows
- OS/2 version
- Outstanding customer support
- Thousands of users worldwide
- French, Spanish, and German versions
- Consulting, conversion and integration services

800-533-6879

**FREE
DEMO DISK
AVAILABLE!**



SCS SOUTHERN COMPUTER SYSTEMS, INC.
Phone (205) 251-2985 • FAX (205) 322-4851
In Europe: SCS Europe, Ltd. 0753-36550 • FAX 0753-36765

Peripherals/Supplies

BEST PRICE **USER FRIENDLY**

PC 9 TRACK or 3480

DIGI-DATA

8580 Dorsey Run Road • Jessup, MD 20794
800/782-6395 **FAX 301/498-0771**

Conversions

**It's the
Classified
Marketplace**

Reach Computer Professionals Where They Shop For:

- Buy/Sell/Lease
- Conversions
- PC Rentals
- Hardware
- Software
- Peripherals/Supplies
- Communications
- Time/Services
- Business Opportunities
- Used Equipment Listings
- Graphics/Desktop Publishing
- Bids/Proposals/Real Estate

(800) 343-6474
(in MA., 508/879-0700)

**CONVERSION
SPECIALISTS**

**AUTOMATED
CONVERSIONS
TAILORED
TO YOUR NEEDS**

DOS TO MVS
PLATFORM TO PLATFORM
HONEYWELL TO IBM
WANG TO IBM
MACRO TO COMMAND
RPG TO COBOL
PL1 TO COBOL
MOST LANGUAGE/CONVERSIONS

BELCASTRO COMPUTER SERVICES, INC.
631 VIENNA AVE.
NILES, OH 44446
(800) 521-2861

Education/Training

COMPUTERWORLD**Classified
Marketplace**

delivers your message in companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call:
(800) 343-6474
(in MA., 508/879-0700)

**AMERICAN INSTITUTE FOR
COMPUTER SCIENCES**
offers B.S. and M.S. in Computer Science. All courses by correspondence. Increase your earning power. For more information call 1-800-767-2427

CHADWICK UNIVERSITY
offers B.S. and M.B.A. programs in Business Administration. All courses by correspondence. Increase your earning power. For more information call 1-800-767-2423.

**CLASSIFIED
MARKETPLACE**
Call for all the details
**(800)
343-6474**
(in MA., 508/879-0700)

Time/Services

**FINANCIAL TECHNOLOGIES**

Information you can bank on!

**Innovative, Responsive,
Quality**

a few words that describe the most complete computer processor offering....

IBM 3090, MVS/XA, MSA, DB2, VM/HPO, TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

1-800-443-8797

14300 Sullyfield Circle
Chantilly, Virginia 22021

**OUTSOURCING AND
REMOTE COMPUTING**

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
 - Media Conversion
 - Laser & Impact Print Facility
 - Application Programming
- Technical Support
- 24 Hours a Day - 7 Days a Week

May & Speh, inc.

1501 Opus Place, Downers Grove, IL 60515-5713
1(800) 729-1501
For More Information Contact: Tony Ranier

**REMOTE
CONTROL**

Remote Processing that puts you in control.

- VM/XA, MVS/XA, DOS/VSE
- Guaranteed Service Levels
- Fixed Pricing
- Expert Professional Staff
- Disaster Recovery Services
- Satellite Communications
- Printing & Mail Services



Agway Data Services Inc.
Call 1-800-ADS-7112

Your used computer equipment deserves a second chance.

If you have used computer equipment to sell, Computerworld's Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Buy/Sell/Lease section to help you market your equipment to the very people who are looking to buy. And when you advertise in Computerworld's Classified Marketplace, you reach a total (ABC-audited) audience of over 629,000 computer professionals who turn to Computerworld for news, information, features - and the Classified Marketplace - every week. So give your used computer equipment a second chance today. To reserve your space, call:

800/343-6474
(in MA., 508/879-0700)

**REMOTE
COMPUTING**

- We locate COMPUTER TIMESHARING, Including OUTSOURCING on ALL mainframes.
 - Since 1968 we have found your LOWEST prices from over 800 nationwide data centers.
 - NEVER a charge to the Buyer, because our fee is paid by the Seller.
- CALL DON SEIDEN AT
COMPUTER
RESERVES, INC.**

(201) 882-9700

**COST-EFFECTIVE
COMPUTING SERVICES
for TODAY and....
TOMORROW****COMDISCO COMPUTING
SERVICES CORP.**

Provides you with:

**REMOTE COMPUTING
INFO. TECH. SOURCING
FACILITY MANAGEMENT**

Featuring:

- IBM® CPUs and Peripherals
- Systems Software: MVS/ESA, MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, DOS/VSE, HPO, CMS
- Application Software: Database Management Application Development 4/GLs Graphics Statistical Analysis
- Multiple Communications Methods
- Technical/Operations/Production Support
- Automated Tape Handling
- ULTRA-Secure Data Center
- Advanced Laser Printing
- Disaster Recovery Services

Call: Robert Marino

201-896-3011

COMDISCO

**COMDISCO COMPUTING
SERVICES CORP.**

430 Gotham Parkway, Carlstadt, NJ 07072

MVS/ESA • DB2 • LIBRARIAN
CICS • TSO • SAS • ADABAS

**Outsourcing
& Computing
Services**

- 24 Hours / 7 Days
- Superior Technical Support
- Worldwide Access
- Uninterrupted Service
- On-line/Batch/RJE
- MICR, Laser & Impact Printing
- Media Conversion

908-685-3400

Committed to Excellence in Quality Service and Customer Satisfaction

REMOTE COMPUTING • OUTSOURCING

- | | | |
|-----------|------------|-----------|
| • MVS/ESA | • CICS | • VM/370 |
| • MVS/XA | • TSO | • CMS |
| • DB2 | • IMS/DBDC | • DOS/VSE |

OVER 150 SOFTWARE PRODUCTS

- | | |
|----------------|---------------|
| • DEVELOPMENT | • DEBUGGING |
| • PRODUCTIVITY | • PERFORMANCE |

- | | |
|------------|---------------------------|
| • TELNET | • TYMNET |
| • SEARSNET | • IBM INFORMATION NETWORK |

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS INFORMATION
SYSTEMS, INC.

815 Commerce Drive, Oak Brook, IL 60521

708-574-3636

New England
617-595-8000

SALES OFFICES
Associate Publisher/Senior Vice President Sales
Kevin McPherson

BOSTON: Vice-President Eastern Advertising Sales/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) B79-0700

CHICAGO: Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivan, Karol Lange, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433

NEW YORK: Senior District Manager/Fred LoSapio, District Manager/Paula D'Amico, Sales Assistants/Susan Kusnic, Patricia DeBlase, COMPUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

LOS ANGELES: Southwestern Regional Manager/Fran Cowen, Sales Assistant/Bev Raus, COMPUTERWORLD, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Senior District Manager/Emile Chamberlain, District Managers/Michele Gerus, Kaye Sharbrough, District Manager/John J. Flood, Sales Assistants/Chris Kobayashi, Carol Lacasse, Lisa Cremarosa, COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Senior District Manager/Bernie Hockswender, Sales Assistant/Debra Brown, COMPUTERWORLD, 1400 Lake Hamn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Southeastern District Manager/Daren Ford, Sales Assistant/Brenda Shipman, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: District Manager/Paula D'Amico, COMPUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

CLASSIFIED ADVERTISING SALES: Vice President/Classified Advertising/John Corrigan, Marketing Director/Derek E. Hultzyk, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) B79-0700

CW PUBLISHING, INC.

An IDG Company: The World's Leader in Information Services on Information Technology.

Gary J. Beach
CEO & Publisher

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Telex: 95-1153X, FAX: 508-B75-4394

Kevin McPherson
Associate Publisher
Senior Vice President/Sales

Matthew Smith
Senior Vice-President
Operations

Steve F. Woit
Senior Vice-President
Marketing

FINANCE Controller, Mark Sullivan.

SALES - DISPLAY Advertising Director, Carolyn Novack, Display Advertising Production Manager, Maureen Hanley. **SALES - CLASSIFIED** Vice President Classified Advertising, John Corrigan.

Classified Marketing Director, Derek E. Hultzyk, Classified Operations Director, Cynthia Delany.

Classified Sales Supervisor, Jay Novack

MARKETING Manager, Marketing Communications, Mary Doyle, Account Manager, Marketing Communications, Elizabeth Phillips, Manager, Trade Show & Conventions, Audrey Shohan, Administrative Assistant, Patty Faherty

CIRCULATION Vice-President Circulation, Gail Odeneal, Director of Circulation Management, Maureen Burke, Director of Circulation Promotion, Carol Spach.

PRODUCTION Vice President/Manufacturing, Leigh Horneth, Director of Publishing Technology, Carol Polack, Production Manager, Beverly Wolff.

SYSTEMS Director of Information Systems, Linda Nelson.

Administrative Sales Assistant, Lois Beninati.

GLOBAL LEADERSHIP NETWORK
FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Comunicaciones 5/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires, Phone: (011) 54 134 5583. Telex: (390) 22644 (BAZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wan Chai, Hong Kong, Phone: (011) 852 5 861 3238. FAX: (011) 852 5 861 1093.

AUSTRALIA: Alan Power, IOG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (011) 61 2 439 5512.

AUSTRIA: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A-1070 Wien, Austria, Phone: (011) 43 523 16 31 0. Telex: (847) 115542 (SCH/A) FAX: (011) 43 523 05 08 33.

BRAZIL: Ney Kruehl, Computerworld do Brasil Ltda, Praça Floriano, 19-26, 21, 2031 Rio de Janeiro, RJ Brazil, Phone: (011) 55 21 240 8224. Telex: (391) 21 30830 BR.

COLOMBIA: Heli Abel Torrado, La Nueva Ley, Computerworld Colombia, Transv. 23 No. 58-28, Apartado Aereo 54018, Bogota, D.C., Colombia, Tel: (011) 57 248 9010.

DENMARK: Preben Engell, 103 Denmark A/5, Kjøpmannsgade 4K, 2500 Valby Copenhagen, Tel: (011) 45 36 442800. Tel: (011) 45 3566. FAX: (011) 45 442033.

FRANCE: Francois Chauvionne, IDG Communications 5.A., Immeuble La Fayette, 2 Place des Vosges, Cedex 65, 92051 Paris la Defense, France, Tel: (011) 33 1 4904 7900. Telex: (842) 613234F. FAX: (011) 33 1 4904 7800.

HUNGARY: Oezzo Futasi, Computerworld Informatika Co., Kft. Pf. 386, 1536 Budapest, Hungary, Phone: (011) 3611 228 458. Telex: (861) 225307 (KSHP BR). FAX: (011) 3611 423 965.

INDIA: S.K. Bhayana, Media Transasia India Ltd., 102 Andheri Lok, New Delhi 110049, India, Tel: (011) 91 11 644 0110. FAX: (011) 91 11 643 2950.

ITALY: Umberto Costamagna, Computer Publishing Group CPG, Via Vida 2, 20127 Milan, Italy, Phone: (011) 39 2 2613432. Telex: (843) 335318. FAX: (011) 39 2 284 0737.

JAPAN: Jim Povec, IDG Communications Japan, Kioicho 7B8, 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan, Tel: (011) 81 3 222 6566.

MEXICO: Henry Morales, Computerworld Mexico S.A. de C.V., Oficina 21-2, Mexico City 7, 07010, Colonia Roma, 06700 Mexico City, Tel: (011) 52 5 514 4218 or 6309. Telex: (383) 177 1300 (ACHAME). FAX: (011) 525 511 4860.

THE NETHERLANDS: Ruud Bakker, IDG Communications B.V., de Paulus Potstraat 18, 1071 DA Amsterdam, The Netherlands, Tel: (011) 31 20 664 8426/664 5818. Telex: (844) 18242 (CWCOM NL). FAX: (011) 3120 796 006.

INTERNATIONAL DATA GROUP, INC.

Patrick J. McGovern
Board Chairman

Walter Boyd
President

William P. Murphy
Vice President/Finance

Fritz Landmann
Sr. Vice President

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Australia, PC World, Macworld; AUSTRIA'S Computerworld Österreich; BRAZIL'S DataNews, PC Mundo; CANADA'S ComputerData; CHILE'S Informática, Computación Personal; COLUMBIA'S Computerworld Columbia; OEMMARK'S CAD/CAM WORLD; COMPUTERworld Denmark, PC World, Macworld, Unix World; FINLAND'S Mikro PC, Tietovilkkio; FRANCE'S Le Monde Informatique, Distribution, InfoPC, Telecoms International; HUNGARY'S Computerworld SZT, Mikrovilág; INDIA'S Computers & Communications; ISRAEL'S People & Computers; ITALY'S Computerworld Italia, PC World Italia; JAPAN'S Computerworld Japan, Infoword, Publish; KOREA'S Hi-Tech Information/Computerworld; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLAND'S Computerworld Netherlands, PC World, Amiga World; NEW ZEALAND'S Computerworld New Zealand, PC World New Zealand; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge; PEOPLE'S REPUBLIC OF CHINA China Computerworld, China Computerworld Monthly; POLAND'S Computers; SPAIN'S CIM World, Comunicaciones World, Computerworld España, PC World, Amiga World, SWEON'S Computer Sweden, PC/Nyheterna, Mikrodatorn, PC World, Macworld; SWITZERLAND'S Computerworld Schweiz; TAIWAN'S Computerworld Taiwan, PC World; UNITED KINGDOM'S Graduate Computerworld, PC Business World, ICL Today, Lotus UK, Macworld U.K.; UNITED STATES' Amiga World, CIO, Computerworld, Digital News, Federal Computer Week, GamePro, Incider, InfoWorld, International Custom Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish!, Run, Sun Tech Journal; U.S. S.R.'S PC World U.S.R., Manager, PC Express, Network; VENEZUELA'S Computerworld Venezuela, Micro Computerworld; WEST GERMANY'S Computerwoche, Information Management, PC Woche, PC Welt, Amiga Welt, Macworld.

ADVERTISERS INDEX

| | | |
|---|--|------------|
| Apple Computer 42-43 | Lexmark 36 | |
| AT&T Business | Lotus Development Corp 58-59, 82-83 | |
| Communications Services 14-15 | | |
| AT&T International | | |
| Communications Services 69 | | |
| Banyan Systems 89 | | |
| Cabletron Systems 81 | | |
| Candle Corp 34-35, 37 | | |
| CDB Software 56 | | |
| Codex 64 | | |
| Compaq Computer Corp 62-63 | | |
| CW Circulation 98 | | |
| CW Recruitment 61 | | |
| DCA 33 | | |
| Digital Consulting 80 | | |
| Digital Equipment Corp 19-21, 46-47 | | |
| Empact Software 77 | | |
| ERI 48-49 | | |
| Fifth Generation 38, 40 | | |
| GE Capital Computer Leasing 18 | | |
| George Mason University 56 | | |
| IBM 23, 30-31, 50-51, 86-87 | | |
| IDEA Courier 92-93 | | |
| IDG Taiwan 52 | | |
| Information Builders 26 | | |
| Informix 44 | | |
| Intersolv 45 | | |
| IPL Systems 66-67 | | |
| J.D. Edwards 68 | | |
| Knowledgeware 72-73 | XDB Systems 41 | |
| This index is provided as an additional service. The publisher does not assume any liability for errors or omissions. | | |
| Have A Problem With Your Subscription? | | |
| We want to solve it to your complete satisfaction, and we want to do it fast. Please write to: | | |
| COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043. | | |
| Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence. | | |
| Address Changes or Other Changes to Your Subscription | | |
| All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time. | | |
| Your New Address Goes Here | | |
| Name | | |
| Company | | |
| Address | | |
| City | State | Zip |
| Address shown: <input type="checkbox"/> Home <input type="checkbox"/> Business | | |
| Other Questions and Problems | | |
| It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: | | |
| 1-800-669-1002 | | |
| Outside U.S. call: (614) 382-3322 | | |
| COMPUTERWORLD | | |
| P.O. Box 2043, Marion, Ohio 43305 | | |

STOCKS

INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM BUY TO HOLD: **Conner Peripherals, Inc.** (Bear, Stearns & Co.). Stagnation in the 2½-in. disk drive segment is driving gross margins down and limiting revenue growth. However, the recent strength is in the 3½-in. drive market, which is propelled by inventory replenishment and, therefore, probably temporarily delays the prospects for an industry shake-out. The focus on cost on the part of **Compaq Computer Corp.**, which is Conner's largest customer, will spread to Compaq's competitors. This is bad news for Conner because these rivals are the balance of its customers. Accordingly, earnings estimates for this year and next were reduced.

DOWNGRADED FROM ATTRACTIVE TO NEUTRAL: IBM (Paine Webber, Inc.). Despite the near-term, high-end mainframe order backlog, IBM may not be able to sustain big-iron momentum much into 1992. Two of the company's most important markets — Germany and Japan — are slowing down. Fourth-quarter 1991 and fiscal year 1992 earnings estimates have also been cut as a result of these factors. The possibility of further restructuring measures before the end of the year makes for stock price uncertainty.

ANALYSIS IN BRIEF

Channel Tracker

Shearson Lehman Brothers, Inc., New York

November 1991

Based on stock price, the best performers among personal computer hardware and software distributors are **Merisel, Inc.** and **Tech Data Corp.**

The value of stock in Merisel, a company that sells both hardware and software, has jumped more than 200% since December 1990, while Tech Data, which is primarily a hardware distributor, had an increase of about 170% since January. Both are turnaround stories for the period studied.

Software Spectrum, a reseller, and **Government Technology Services, Inc.** (GTSI), which primarily sells software to government offices, are among the top players for return on equity (ROE) rates. Software Spectrum's ROE topped 44% for the 12 months ended June 1991, and GTSI came in at just under 33%. Both had initial public offerings this summer, and their ROEs are based on equity from the period before they went public.

As for revenue growth, the top performers include **Staples, Inc.**, with 113% growth comparing the 12 months ended July 1991 to fiscal 1990. Tech Data grew 46% during a similar period.

As a group, the systems integrators have the best average margins: about 11% operating and 7% net. Hardware resellers and distributors have almost a 4% average operating margin and a 2% average net margin, while software companies are slightly lower in both areas. The higher margins posted by integrators are not lost on resellers, many of which are adding new value-added services.

It is no surprise that **Electronic Data Systems Corp.** is the biggest revenue company in this sector. EDS gets more than half its income from General Motors Corp., which owns it. Overall, EDS' \$6.5 billion in sales is more than twice the revenue of the next largest general distributor tracked in this study, **JWP, Inc.**, a hardware reseller and franchiser that recently bought **Businessland, Inc.**

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Among top gainers, Digital Equipment Corp. jumped 3½ points to close Tuesday at 64¾. IBM also advanced, picking up 2½ points and moving to 97¾. Data General Corp. added ¾ of a point to 15¼.
 - Borland International, Inc. dropped 1 point to 71. Brokerage firm Shearson Lehman Brothers, Inc. called the firm the "newest personal computer cult stock."
 - Software stocks were mixed, but losers included Aldus Corp., which slipped 1½ points to 35½, and Lotus Development Corp., which dropped 2 points to 20. System Software Associates, Inc. gained 1½ points to 27.
 - Elsewhere, Knowledgeware, Inc. rose ¾ of a point to 12¾ last week. The computer-aided software engineering (CASE) company lost ground recently after announcing layoffs. Meanwhile, rival Texas Instruments, Inc., which unveiled a new CASE tool last week, slid ¾ of a point to 28¾. Intersolv, Inc. dipped ½ of a point to 12¾, after reporting positive fiscal second-quarter earnings.

Computerworld Weekly Stock Ticker

CLOSING PRICES WEDNESDAY, NOVEMBER 27, 1991

| TOP PERCENT GAINERS | | | TOP PERCENT LOSERS | | | Exch | 52-Week | Range | Nov. 27 Close | Wk Net Change | Wk Pct Change | |
|---|-------|--------------------------|-----------------------|-----|-------|-------|----------------------|-------|---------------------------|---------------|---------------|--------|
| Stratus Computer Inc. | 11.11 | Ultimate Corp. | -21.43 | OTC | 15.13 | 4.38 | ASK Computer Sys. | 11.63 | -0.63 | -5.10 | | |
| Information Int'l | 10.81 | Computer Automation Inc. | -13.07 | NYS | 39.75 | 25.00 | Auto Data Processing | 37.63 | 0.75 | 2.03 | | |
| Information Resources | 9.88 | Televideo Systems | -11.03 | OTC | 62.25 | 29.50 | Autodesk Inc. | 32.00 | 1.00 | 3.23 | | |
| IPL Systems Inc. | 8.06 | Microcom Inc. | -10.00 | OTC | 35.50 | 19.75 | BGS Systems Inc. | 32.50 | 0.00 | 0.00 | | |
| Micron Technology | 8.00 | Unisys Corp. | -9.09 | OTC | 66.50 | 21.25 | BMC Software Inc. | 65.50 | -0.88 | -1.32 | | |
| TOP DOLLAR GAINERS | | | TOP DOLLAR LOSERS | | | OTC | 16.00 | 8.75 | Boole & Babbage Inc. | 13.00 | -0.63 | -4.59 |
| Stratus Computer Inc. | 4.50 | Picturetel Corp. | -2.63 | OTC | 20.88 | 7.38 | Borland Int'l | 71.88 | -2.63 | -3.52 | | |
| Digital Equipment Corp. | 3.00 | Borland Int'l | -2.63 | NYS | 11.13 | 6.25 | Cognos Inc. | 8.00 | -0.63 | -7.25 | | |
| Information Resources | 2.00 | Aldus Corp. | -2.25 | OTC | 17.75 | 9.00 | Computer Horizons | 9.50 | -0.25 | -2.56 | | |
| American Info Techs Corp. | 1.50 | Matsushita Electronics | -1.75 | OTC | 73.25 | 46.13 | Computer Sciences | 64.50 | -0.88 | -1.34 | | |
| 3M Corp | 1.38 | Silicon Graphics | -1.63 | OTC | 11.25 | 7.00 | Computer Task Group | 7.63 | 0.13 | 1.67 | | |
| Exch 52-Week Range | | | Nov. 27 Wk Net Wk Pct | | | OTC | 22.75 | 13.00 | Comshare Inc. | 14.75 | 0.25 | 1.72 |
| Communications and Network Services | | | Close Change Change | | | OTC | 13.25 | 6.00 | Corporate Software | 10.75 | 0.00 | 0.00 |
| Off 0.34% | | | OTC | | | OTC | 56.88 | 35.00 | General Motors E (EDS) | 52.13 | -0.88 | -1.65 |
| OTC 12.63 5.50 3 COM Corp. | | | OTC | | | OTC | 18.75 | 8.50 | Goal Systems Int'l | 9.50 | 0.00 | 0.00 |
| NYS 69.75 55.75 American Info Techs Corp. | | | OTC | | | OTC | 7.00 | 1.88 | Hogan Systems Inc. | 5.25 | 0.00 | 0.00 |
| NYS 40.38 29.00 AT&T | | | OTC | | | OTC | 29.25 | 8.88 | Information Resources | 22.25 | 2.00 | 9.88 |
| OTC 4.13 0.88 Artel Communication Corp. | | | OTC | | | OTC | 15.88 | 2.63 | Informix Corp. | 14.13 | 0.00 | 0.00 |
| NYS 56.25 43.00 Bell Atlantic Corp. | | | OTC | | | OTC | 3.63 | 1.06 | Intelicorp Inc. | 1.38 | 0.06 | 4.72 |
| NYS 56.25 46.13 BellSouth Corp. | | | OTC | | | OTC | 31.50 | 11.50 | Intergraph | 17.75 | 0.75 | 4.41 |
| NYS 52.88 24.00 Cabletron Systems | | | OTC | | | OTC | 10.50 | 3.00 | Interleaf Inc. | 8.63 | -0.38 | -4.17 |
| OTC 29.25 8.25 Compression Labs Inc. | | | OTC | | | OTC | 14.88 | 6.88 | Intersolv | 13.50 | 0.75 | 5.88 |
| OTC 5.13 1.50 Data Switch Corp. | | | OTC | | | OTC | 43.25 | 10.50 | Knowledgeware Inc. | 12.25 | 0.25 | 2.08 |
| NYS 21.50 11.00 Digital Comm. Assoc. | | | OTC | | | OTC | 45.00 | 20.25 | Legent Corp. | 34.00 | 1.25 | 3.82 |
| OTC 25.25 14.00 Dynatech Corp. | | | OTC | | | OTC | 40.75 | 14.75 | Lotus Development | 19.75 | -1.50 | -7.06 |
| OTC 12.38 5.00 Fibronix Int'l Inc. | | | OTC | | | OTC | 19.00 | 11.25 | Mentor Graphics | 14.63 | 0.00 | 0.00 |
| OTC 22.50 6.50 FileNet Corp. | | | OTC | | | OTC | 32.00 | 9.75 | Micrografx | 14.00 | -0.75 | -5.08 |
| OTC 3.75 1.75 Gandalf Technologies Inc. | | | OTC | | | OTC | 101.75 | 45.25 | Microsoft Corp. | 95.25 | -0.75 | -0.78 |
| NYS 3.88 1.88 General Datacomm Inds. | | | OTC | | | OTC | 16.63 | 5.50 | Oracle Systems | 13.63 | -0.75 | -5.22 |
| NYS 34.13 27.50 GTE Corp. | | | NYS | | | OTC | 16.25 | 7.75 | Pansophic Systems | 16.25 | 0.00 | 0.00 |
| NYS 63.00 44.88 ITT Corp. | | | OTC | | | OTC | 10.00 | 1.63 | Phoenix Technologies | 8.00 | 0.38 | 4.92 |
| OTC 31.88 17.88 MCI Communications Corp. | | | OTC | | | OTC | 23.50 | 9.00 | Platinum Technology | 17.50 | 0.25 | 1.45 |
| OTC 14.50 3.25 Microcom Inc. | | | OTC | | | OTC | 60.25 | 38.63 | Policy Management Sys. | 59.00 | -0.13 | -0.21 |
| OTC 15.13 4.00 Network Equipment Tech. | | | NYS | | | OTC | 31.50 | 15.00 | Reynolds & Reynolds | 30.25 | 0.00 | 0.00 |
| OTC 15.38 6.25 Network General | | | OTC | | | OTC | 15.00 | 6.75 | Ross Systems | 11.50 | 0.25 | 2.22 |
| OTC 18.88 9.63 Network Systems Corp. | | | OTC | | | OTC | 27.50 | 16.75 | SEI Corp. | 22.88 | -0.25 | -1.08 |
| OTC 46.25 24.75 Northern Telecom Ltd. | | | OTC | | | OTC | 35.25 | 13.00 | Shared Medical Systems | 17.63 | -1.50 | -7.84 |
| OTC 51.75 14.00 Novell Inc. | | | NYS | | | OTC | 19.25 | 7.00 | Software Publishing Corp. | 13.00 | -1.00 | -7.14 |
| NYS 79.25 67.00 Nyxex Corp. | | | OTC | | | OTC | 18.25 | 9.88 | Sterling Software | 17.50 | 0.38 | 2.19 |
| NYS 47.00 38.50 Pacific Telesis Group | | | OTC | | | OTC | 35.25 | 10.88 | Sungard Data Sys. | 17.25 | 0.13 | 0.73 |
| OTC 11.63 4.50 Penril Data Comm. Ntwks. | | | NYS | | | OTC | 13.75 | 4.50 | Symantec Corp. | 29.50 | 0.75 | 2.61 |
| OTC 43.50 8.50 Picturetel Corp. | | | OTC | | | OTC | 37.25 | 12.50 | System Center Inc. | 10.25 | -0.75 | -6.82 |
| NYS 17.88 11.50 Scientific Atlanta Inc. | | | NYS | | | OTC | 12.25 | 4.13 | System Software Assoc. | 27.75 | -0.75 | -2.63 |
| NYS 61.25 49.00 Southwestern Bell Corp. | | | NYS | | | ASE | 6.75 | 2.13 | Western Digital Corp. | 2.25 | -0.13 | -5.26 |
| NYS 31.50 20.63 United Telecom | | | NYS | | | | | | | | | |
| NYS 40.75 33.88 US West Inc. | | | NYS | | | | | | | | | |
| Computer Systems | | | Off 0.72% | | | | | | | | | |
| OTC 20.75 6.50 Advanced Logic Research | | | OTC | | | OTC | 2.75 | 1.06 | Peripherals & Subsystems | 14.38 | 0.50 | 3.60 |
| ASE 17.88 11.63 Amdahl Corp. | | | OTC | | | OTC | 12.50 | 5.75 | Apertus Technologies | 15.50 | 0.25 | 1.64 |
| OTC 73.25 36.00 Apple Computer Inc. | | | OTC | | | OTC | 27.75 | 6.25 | Banctec Inc. | 24.00 | -0.25 | -1.03 |
| OTC 9.13 2.75 Archive Corp. | | | OTC | | | OTC | 13.50 | 6.50 | Camdex Corp. | 9.50 | 0.00 | 0.00 |
| OTC 32.75 12.38 AST Research Inc. | | | OTC | | | OTC | 59.25 | 34.00 | Cognitronics Corp. | 13.00 | -0.50 | -3.70 |
| NYS 9.38 4.25 Bolt, Beranek & Newman | | | OTC | | | OTC | 12.50 | 5.38 | Conner Peripherals | 41.13 | 0.13 | 0.30 |
| NYS 21.63 8.75 Commodore Int'l | | | OTC | | | OTC | 19.13 | 9.00 | Eastman Kodak Co. | 16.50 | 0.13 | 0.76 |
| NYS 74.25 24.00 Compaq Computer Corp. | | | OTC | | | OTC | 12.50 | 5.75 | Emulex Corp. | 46.50 | 0.13 | 0.27 |
| OTC 2.63 0.38 Computer Automation Inc. | | | OTC | | | OTC | 11.75 | 5.75 | Printronix Inc. | 5.63 | 0.00 | 0.00 |
| NYS 13.75 6.75 Control Data Corp. | | | NYS | | | OTC | 24.00 | 14.75 | QMS Inc. | 19.50 | 0.25 | 1.30 |
| NYS 19.75 9.00 Convex Computer | | | OTC | | | OTC | 9.00 | 4.00 | Convergent Technologies | 7.88 | 0.50 | 6.78 |
| NYS 52.25 26.38 Cray Research Inc. | | | OTC | | | OTC | 18.25 | 12.75 | Iomega Corp. | 16.75 | 1.25 | 8.06 |
| NYS 22.50 3.75 Data General Corp. | | | OTC | | | OTC | 6.25 | 1.63 | IPL Systems Inc. | 4.88 | 0.00 | 0.00 |
| NYS 4.38 1.00 Datapoint Corp. | | | NYS | | | OTC | 18.00 | 5.50 | Maxtor Corp. | 8.00 | -0.38 | -4.48 |
| OTC 36.25 12.50 Dell Computer Corp. | | | OTC | | | OTC | 97.50 | 78.25 | Micropolis Corp. | 87.25 | 1.38 | 1.60 |
| NYS 83.00 47.50 Digital Equipment Corp. | | | OTC | | | OTC | 10.75 | 5.50 | 3M Corp. | 6.00 | 0.13 | 2.13 |
| NYS 28.88 18.25 Harris Corp. | | | OTC | | | OTC | 26.75 | 11.50 | Printrex Inc. | 17.63 | -0.13 | -0.70 |
| NYS 56.63 27.13 Hewlett Packard Co. | | | OTC | | | OTC | 18.25 | 9.13 | Quantum Corp. | 9.25 | -0.63 | -6.33 |
| NYS 139.75 94.00 IBM | | | NYS | | | OTC | 8.00 | 4.38 | Recognition Equipment | 7.00 | 0.25 | 3.70 |
| OTC 12.00 7.75 Information Int'l | | | OTC | | | OTC | 11.50 | 4.88 | Rexon Inc. | 7.50 | 0.25 | 3.45 |
| OTC 145.75 105.00 Matsushita Electronics | | | NYS | | | OTC | 19.88 | 7.13 | Seagate Technology | 8.75 | -0.25 | -2.78 |
| OTC 20.88 7.50 MIPS Computer Systems | | | OTC | | | OTC | 51.50 | 17.75 | Storage Technology | 39.38 | -0.75 | -1.87 |
| OTC 29.50 10.75 Pyramid Technology | | | NYS | | | OTC | 30.88 | 16.00 | Tektronix Inc. | 17.63 | 0.13 | 0.71 |
| OTC 19.75 7.50 Sequent Computer Sys. | | | OTC | | | OTC | 0.53 | 0.16 | TeleVideo Systems | 0.25 | -0.03 | -11.03 |
| NYS 48.75 22.25 Silicon Graphics | | | NYS | | | OTC | 66.00 | 33.25 | Xerox Corp. | 81.63 | 0.00 | 0.00 |
| NYS 45.88 20.00 Stratus Computer Inc. | | | NYS | | | | | | | | | |
| OTC 38.63 18.13 Sun Microsystems Inc. | | | NYS | | | | | | | | | |
| NYS 17.63 9.13 Tandem Computers Inc. | | | OTC | | | | | | | | | |
| OTC 4.75 1.25 Tandon Corp. | | | OTC | | | | | | | | | |
| NYS 36.50 23.38 Tandy Corp. | | | NYS | | | | | | | | | |
| OTC 24.50 8.25 Teradata | | | OTC | | | | | | | | | |
| NYS 6.13 1.38 Ultimate Corp. | | | NYS | | | | | | | | | |
| NYS 7.00 2.00 Unisys Corp. | | | OTC | | | | | | | | | |
| ASE 5.75 2.00 Wang Labs Inc. (b) | | | NYS | | | | | | | | | |
| Software & DP Services | | | Off 0.64% | | | | | | | | | |
| OTC 63.00 23.50 Adobe Systems Inc. | | | OTC | | | | | | | | | |
| OTC 12.25 3.50 Alcorp | | | OTC | | | | | | | | | |
| OTC 59.88 23.13 Aldus Corp. | | | OTC | | | | | | | | | |
| OTC 28.50 15.00 American Mgmt. Systems | | | OTC | | | | | | | | | |
| OTC 17.25 9.00 American Software Inc. | | | OTC | | | | | | | | | |
| NYS 4.63 1.50 Anacom Inc. | | | OTC | | | | | | | | | |
| OTC 18.25 11.88 Analysts Int'l | | | OTC | | | | | | | | | |
| Leasing Companies | | | Off 1.26% | | | | | | | | | |

Copyright Nordby International, Inc., Boulder, Colo.

This information is obtained from sources believed to be reliable but cannot be guaranteed to be completely accurate. This information is subject to change without notice.

Computers crack down on child support

States can cut welfare expenses and help families by automating support enforcement programs

BY MITCH BETTS
CW STAFF

Information systems executives in state governments have a rare opportunity to look like heroes, if they are brave enough to take advantage of it.

By automating the complex process of enforcing child-support laws, IS managers can cut welfare outlays, avoid federal penalties and provide a big return on the investment, according to David Lema, president of Government Technology Group, Inc., an IS consulting firm based in Sacramento, Calif.

"The value of some [government] IS projects is very nebulous, but if you implement a good child-support enforcement application, you'll actually improve the bottom line," he said.

However, some states are putting the project on the bottom of the IS project list. They view it as just another federal mandate that they lack the resources to fulfill, Lema said.

The U.S. Congress, which has passed several laws requiring states to strengthen their child-support enforcement pro-



Janell Genovese

grams, has long been convinced that a heavy dose of computer technology is needed to cure one of the nation's most pressing problems. Millions of children are impoverished because of "deadbeat dads" who fail to make their court-ordered payments.

The latest government statistics show that only 50% of the 5 million U.S. women with legal orders for child support actually receive the full amount. Many of the families left behind wind up needing government welfare payments.

Several laws now require states to boost the collection of child-support payments through the use of automated case-management systems and electronic records searches to locate absent fathers.

Time to act
States are required to have their automated systems in place and certified by October 1995, or they face a ma-

jor financial penalty — the loss of 1% to 5% of their federal welfare funds. The reason for the deadline is that many states are lagging behind, and a few have barely started to tackle what is by all accounts a difficult IS development project. Only eight states have federally certified computer systems (see chart).

The federal government will pay 90% of the IS development costs until the 1995 deadline.

The systems can cost anywhere from \$13 million to \$70 million and take several years to plan, procure and install, experts said. There is no typical system because state laws and procedures for child-support enforcement vary widely, so most states have to reinvent the wheel.

The laggards are paralyzed "by the daunting complexity of it," as well as the lack of money and staff, said Robert G. Williams, president of Policy Studies, Inc., a government consulting and systems development firm based in Denver.

Besides the usual government procurement hassles and turf battles, IS managers developing these systems must deal

with the very complex financial, regulatory and legal processes involved in court-ordered child support, Williams said.

One of the states just getting started is California. "We have every intention of aiming for that 1995 date to be certified, but it's ambitious, and we know that," said Elaine Moody, chief of California's child-support automation bureau.

In California, county governments run the child-support program, so the state is planning a distributed computer network to link 57 of its counties plus an interface to Los Angeles County, which is developing its own system because of its huge caseload.

Los Angeles County is starting from scratch, beginning with

tribution of money that has been collected.

The new system gets a check to the custodial parent in less than five days, compared with about six weeks under the manual operation, according to Alabama and Unisys officials.

Experts in Alabama and other states said the most successful implementations have featured cooperative processing to off-load much of the processing to desktop systems. They also use relational database management software with a common data dictionary, so the system can adapt to the program's many regulatory changes.

"These systems are never completed. Laws are constantly changing, so we have to respond rapidly with changes in the automated systems," said Larry Walker, supervisor of Washington state's enforcement system.

Automation has become a necessity as budget-strapped

THE U.S. CONGRESS has long been convinced that a heavy dose of computer technology is needed to cure one of the nation's most pressing problems.

a business re-engineering phase to make the child-support program more efficient before automating it, according to Holli Ploog, a senior vice president at Lockheed Information Management Systems Co., which is the county's contractor.

Alabama making progress
One of the states that has successfully automated its child-support operation is Alabama, whose \$13 million system features 400 Unisys Corp. CTOS workstations located at 156 sites and linked to the state's data center. The system manages 300,000 child-support cases, from the moment a woman applies for child support to the dis-

states face growing caseloads that must be handled by fewer people, said Margaret C. Haynes, director of the American Bar Association's Child Support Project. But the slow and uneven adoption of technology has critics growing impatient with the laggards.

"Some states are still operating out of shoe boxes with index cards," said Geraldine Jensen, president of the nationwide Association for Children for Enforcement of Child Support, based in Toledo, Ohio.

"Ultimately the children are the losers. The longer it takes to get automation, the longer it takes to solve the problem," she said.

'Find your man'

The Electronic Parent Locator Network (EPLN) might be a little too effective for its own good.

Authorities in the Southeast who need to locate absent fathers can turn to an IBM mainframe database in South Carolina that holds 90 million records on individuals in 10 states. Officials using EPLN have a 60% to 80% success rate of finding their man because the database tracks who gets driver's licenses and jobs in the region.

EPLN advocates would like to make it nationwide, but the federal government is steering away from that idea because of the Big Brother implications of having such a huge government databank as well as the storage and maintenance burden.



Instead, the federal government is leaning toward the more indirect method of having states use an electronic messaging network to request that other jurisdictions search their records.

The U.S. Commission on Interstate Child Support is planning to recommend the creation of a nationwide computer network allowing states to obtain information from federal and state agency computers within 48 hours of the request.

The network would be a big expansion of the more limited network being planned by the federal Office of Child Support Enforcement, called CSENET. The \$20 million CSENET will handle electronic transfers of case files among states but will not provide locator services.

MITCH BETTS

High mark is nothing to brag about

A congressional panel gave Alabama's child-support enforcement program the highest grade, although it was only a C

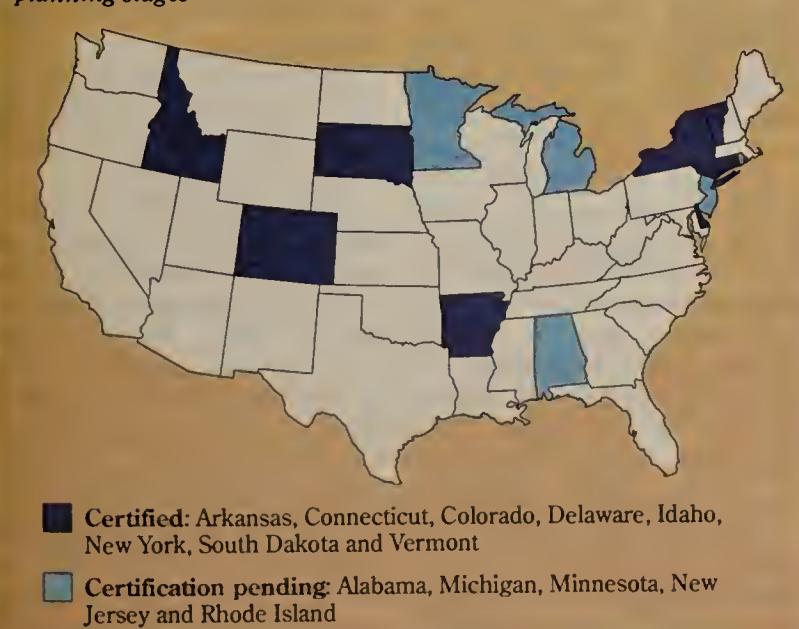
| State rankings, fiscal 1989 | Grade | Grade-point average |
|-----------------------------|-------|---------------------|
| 1. Alabama | C | 2.38 |
| 2. Iowa | C | 2.25 |
| 3. Maine | C | 2.13 |
| 49. Maryland | D | 0.63 |
| 50. Oklahoma | F | 0.38 |

(Scale: 0 to 4.0)

Source: U.S. House Committee on Ways and Means
CW Chart: Janell Genovese

Eight is not enough

Eight states have federally certified computer systems for child-support enforcement, but many states are just in the development or planning stages



Source: U.S. Administration for Children and Families (September 1991)

NEWS SHORTS

More Nynex layoffs to come

Nynex Corp. said last week it will lay off another 1,500 management employees during the next two years. They will join some 1,900 others scheduled to leave by the first quarter of 1992, for a total management reduction of almost 11%. A spokesman said some information systems managers may be among those out the door. That decision will be made on a line-of-business basis by January. Additionally, some 6,500 union employees will have opted for the early retirement incentive by year's end, he said.

Wang license fee hike blocked

A federal judge in San Francisco last week issued an injunction stopping Wang Laboratories, Inc. from raising prices on licenses for operating system software for used equipment. TSJ, Inc., a Wang hardware reseller, sued the Lowell, Mass., company last April, charging unfair license fee practices. After April 1, Wang jacked up a flat \$1,000 fee to transfer a license to as much as \$100,000 in some cases. Separately, Wang said it will license its single in-line memory module (SIMM) devices to Micron Technology, Inc. Wang recently won a SIMM patent infringement suit against Toshiba Corp. and NEC Corp.

Broderbund, Bachman do the IPO

Broderbund Software, Inc. last week completed an initial public offering of 3.2 million shares for \$11 each. All shares were offered by existing stockholders of the Novato, Calif.-based software maker. Broderbund makes personal productivity and entertainment applications for microcomputers. Bachman Information Systems, Inc. in Burlington, Mass., a computer-aided software engineering vendor, offered 2 million shares Wednesday, priced at \$15 each.

Macparadox may be on the way

Borland International, Inc. and Apple Computer, Inc. are working closely together on a database project, Borland President Philippe Kahn revealed recently. Although Apple users have clamored for a Macintosh version of Borland's Paradox database for years, officials at the Scotts Valley, Calif.-based Borland have thus far concentrated their efforts on the DOS and Windows platform. No arrival date was mentioned for the new product.

Switch at a discount to SQL Server

Microsoft Corp. has unveiled a program through which users of SQL products from Gupta Technologies, Inc., IBM, Novell, Inc. and Oracle Corp. can purchase Microsoft SQL Server Version 1.11 for \$2,995 for an unlimited license, as opposed to the \$7,995 list price. Owners of eight-user versions of the products can buy a 10-user SQL Server license for \$1,495 instead of the usual \$2,995 list price. The policy runs through Jan. 31.

Planes, trains and automobiles . . .

NCR Corp. last week formed a marketing organization aimed at the transportation industry. NCR and parent AT&T already count companies such as American Airlines, United Parcel Service, Inc. and others as customers. NCR's Transportation Industry Marketing Group will be headed by David Hubbard, previously in charge of AT&T Computer Systems' sales and marketing to airline customers.

Not with this data you don't

The comprehensive crime bill poised for congressional approval at press time but under threat of presidential veto would modernize the 1984 Computer Fraud and Abuse Act. It would extend the legal concept of computer "access" to include the intentional transmission or distribution of unauthorized software that damages computer data, software or hardware. The bill would also make it a misdemeanor to "recklessly" transmit destructive software, and it would allow civil actions that could result in the payment of compensatory damages to people suffering losses caused by computer abuse.

High-speed net bill gets OK

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. Congress has passed legislation that will establish a national high-speed computer network and nearly double federal spending on high-performance computing research and development. The president is expected to sign the measure.

The bill, originally drafted by Sen. Albert Gore (D-Tenn.) three years ago, provides \$3 billion over five years — \$1 billion in new funding — to develop the National Research and Education Network (NREN). It will have a bandwidth of more than 1G bit/sec. and feature large-scale parallel computers operating at 1 trillion operations per second.

The bill also calls for establishing nationally distributed libraries of software and data, as well as stepped-up funding for basic research and education.

The National Science Foundation has begun research intended to lead to NREN's creation by funding five high-performance network test beds. NREN had been thought of as a

tool for university and government scientists, but it is now being viewed as a public utility to which commercial interests using high-speed data applications such as videoconferencing would have widespread access.

The legislation said NREN must be designed, developed and operated in collaboration with potential users in government, industry and education. It must foster the development of privately operated high-speed commercial networks and must include accounting mechanisms for charging for the use of copyrighted materials and for the use of the network.

Lightning quick

At a 1989 hearing on the bill, then-director of the Defense Advanced Research Projects Agency Craig Fields pointed out that the proposed NREN would have about 50,000 times the capacity of the 56K bit/sec. networks commonly used today. That is equivalent to the improvement in communication speed from prehistory — when people communicated by smoke signals — until now, he said.

Another major component of

the program is to stimulate the development of very high performance parallel processing computers that are 1,000 times faster than today's supercomputers. They would be used to solve the so-called "grand challenges," such as detailed climate modeling, that are beyond the computational ability of today's machines.

In a recent report, Gartner Group, Inc. said the program will generate a cascade of benefits, including a boost in the gross national product that could return the program's investment more than a hundredfold.

The bill largely mirrors an administration-sponsored program under way, but its advantage is that it would lock in funding for five years. The new legislation also puts more emphasis on information services such as access to federal scientific data and gateways to commercial information services.

The president had threatened to veto an earlier version of the bill because it contained a strict "buy-American" provision. Congress and the White House resolved the months-long deadlock by eliminating the requirement.

McDonald's reheats net management plan

CONTINUED FROM PAGE 1

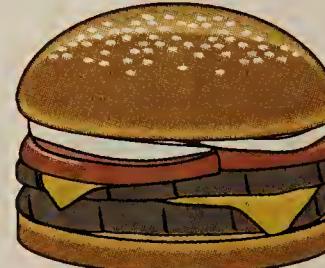
decreases the need for human intervention.

The decision to put the integrated network management project on hold was primarily a matter of resource allocation, Disabato said, adding that information systems management concluded that an integrated manager of network management systems would have to take a budgetary backseat to several other critical projects. These include a corporatewide LAN installation, a fractional T1 backbone and systems to manage both.

"We're focusing our human and monetary resources on top priority projects next year," Disabato said.

Disabato's group will probably put together an RFP and get budget allocations for restarting the project in the latter part of 1992 — or about a year later than originally planned, he said.

McDonald's strategy is in line with other large corporations' plans, according to Jim Herman, principal consultant at Northeast Consulting Resources, Inc., a Boston consulting firm.



"Companies are concentrating now on managing network utilities" that form one type of communications system, such as interconnected LANs, a T1 network or IBM's Systems Network Architecture (SNA), Herman said.

In contrast, few companies see a real payback in integrating the management of these different utilities, Herman added. "In a year, McDonald's may decide that it's not the right thing to do — not because the products aren't there, but because they don't need to."

Disabato acknowledged that he "didn't campaign real hard" to get the integrated management budget reinstated for 1992.

One reason he "did not mind waiting" was the present lack of products to integrate intelligent hubs, which will form the basis of McDonald's LAN management system, with an integrated management platform.

"All the hub vendors we talked to said they only talk to [IBM's] Netview right now, and we don't plan to use Netview," Disabato said.

McDonald's uses Netview to manage its IBM SNA installations. But Disabato said he had several reservations about making this system McDonald's "manager of managers" because Netview now runs on a production host. McDonald's wants to put its integrated management "on a platform that is not used for anything else."

One high-priority item for next year is choosing and deploying a network management system for an existing Novell, Inc. LAN installation that links approximately 1,000 workstations at headquarters. In addition to addressing current user concern about LAN reliability, McDonald's wants to make sure it has the right management system on tap when it begins its planned corporatewide LAN deployment sometime in the next year, Disabato said.

McDonald's has chosen its LAN management vendors but is not ready to release the information, Disabato said.

When the delay was announced, Disabato's four-person group had been working on the integrated management project for 18 months and had begun meeting with vendors such as Hewlett-Packard Co., Cabletron Systems, Inc. and Objective Systems Integrators, Inc. to hear presentations. Indeed, the group was on the verge of internally publishing an architecture "to see if it fit with the company's overall platform" when the budget got cut, Disabato said.

Users hail frame relay for WAN traffic

CONTINUED FROM PAGE 1

principal at Vertical Systems Group, a consultancy in Dedham, Mass.

Interconnecting local-area networks has been cited as the "killer" frame-relay application because it is suited to the unpredictable "bursts" of packetized traffic traveling between LANs.

However, a mixture of wide-area technologies might be the best approach, depending on how the regional Bell telephone companies price the services they have pledged to deploy — including frame relay, SMDS and ISDN — and the kinds of applications users put on networks.

Currently, "frame relay is attractive when you have lots of traffic between a relatively few number of points; SMDS looks good when you have low traffic densities going to many different sites," explained Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

"ISDN is appropriate for applications that look like a phone call, where you need bandwidth for a long time, such as videoconferencing," Taylor added.

Above 56K bit/sec.

Frame relay is important to the American Cancer Society "because it brings the tested features of packet technology to speeds above 56K bit/sec.," said Jerry Noble, director of telecommunications at the Austin, Texas-based organization. Noble said frame relay interests him as a way to affordably back up file servers to a central site instead of popping for \$2,000-and-up tape backup units at 120 branches.

Frame relay, SMDS and ISDN are all being initially deployed at speeds of up to 1.5M bit/sec. — a source of confusion for users, as SMDS was originally slated for initial speeds of 45M bit/sec. However, carriers such

as AT&T are reportedly working on those speeds for frame relay by year-end 1992.

In its current form, frame relay requires users to predefine who they want to communicate with, presuming a finite networking universe, Taylor explained. In contrast, SMDS and ISDN are public-switched services that target any-to-any connections.

Once frame relay gains a switched option, "there won't be any difference between SMDS and frame relay," Taylor said.

Malone boiled the issue down to tariffs. "The carriers can tweak their pricing for switched vs. leased-line services and shape the market," he said.

Malone advised early public frame-relay users to commit to the smallest amount of bandwidth they can live with because they will be guaranteed that amount of bandwidth at all times plus use any spare bandwidth.

IBM begins restructuring in earnest

CONTINUED FROM PAGE 1

slated to unfold over the coming months and aimed at turning the company into a federation of agile, highly autonomous business units [CW, Nov. 25].

Many users and analysts wondered if — and how soon — the firm could execute its plan.

"This is Akers' last bullet," said Frank Gens, vice president of technical assessment at Technology Investment Strategies Corp., a market research firm based in Framingham, Mass. "He has to make it clear to everyone — users, investors, employees — that IBM knows it has to change to respond to user demands and competitive pressure and that he is willing to do anything it takes to bring that change about."

"The big question is time," added Daniel Cavanagh, senior vice president of information systems at Metropolitan Life Insurance Co. "That's the critical factor."

The pressures that are driving IBM to reinvent itself are relentlessly bearing down on users as well, Cavanagh noted. "CIOs

can't afford to wait for IBM, no matter how much they believe that IBM will get there."

To meet that deadline, IBM outlined a plan to recast its key businesses as entrepreneurial entities. Marketing and service operations will be organized geographically; manufacturing and development units will be organized by product line. "Each company, over time, will report individually its financial results, and the compensation of its executives will be tied more directly to its performance," a spokesman said.

More staff cuts

IBM also said its current work force would be reduced by some 20,000 through incentive plans — on top of the 20,000 jobs eliminated through attrition and early retirement this year — at an estimated cost of \$3 billion.

Analysts said they saw the rapid-fire, no-frills delivery as yet another "get tough" message from Akers.

The frequently voiced IBM theme of "customer dedication

at any cost" loudly sounded during last week's announcements. However, several industry observers noted signs that the company's zeal to serve users may be backfiring.

The flood of employees out of IBM — a bottom-line savings for the firm — is "obviously causing some disarray in marketing support," said Kevin Moody, an analyst at Technology Investment Services Corp. As IBM steps up its efficiency drive, "it's not going to get better," he added.

While industry observers and users generally welcomed IBM's structural game plan, several said they felt Conrades had been made a scapegoat for the ravages of the recession.

As senior vice president of corporate marketing and services, Conrades will report to IBM Senior Vice President Michael Armstrong. IBM Canada Chairman John Thompson was named last week to replace LaBant.

Senior Editor Rosemary Hamilton contributed to this report.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1991 by CW Publishing Inc. All rights reserved.

Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed.

Back issues, if available, may be purchased through Margaret McIndoe, at \$2.00 per issue, plus postage.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Requests for missing issues will be honored only if received within 60 days of issue date.

Subscription rates: \$2.00 a copy: U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface),

\$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

A tangled web

Competing WAN technologies confuse telecom managers

| | Frame relay | SMDS | ISDN |
|--------------------------|---|--|---|
| Availability | Private nets: now Public services: now | Private nets: NA Public nets: Bells: 1992 Infonet: Q2 1993 Other carriers: Trials Q4 1992 | Q4 1992: Bells nationwide 1994: 50% of Bell lines to support ISDN Long-distance carriers: now |
| Speed | 56K bit/sec. — 1.5M bit/sec. now. Evolve to T3 (45M bit/sec.) | 1.5M bit/sec. Evolve to T3 | 144K — 1.5M bit/sec. |
| Unresolved issues | No standard yet for internetwork interoperability. | How will islands of Bell SMDS connect? | Other switched services offer comparable speeds and function. |

Source: Bellcore, carriers, SMDS Interest Group, Frame Relay Forum

CW Chart: Tom Monahan

Novell to take the next step

CONTINUED FROM PAGE 1

IBM and Apple Computer, Inc.'s Taligent and the Advanced Computing Environment consortium.

To abet its entry into that race, sources said, Novell is following a familiar pattern with its plans to invest in Serius Corp., a small, privately held Salt Lake City-based maker of object-oriented software for the Apple Macintosh.

Novell; Los Altos, Calif.-based venture capitalist Crosspoint Venture Partners; and Intermetrics, Inc., a Boston developer of defense-related Unix software, are preparing to close a \$2 million equity investment by Dec. 15, according to several sources, including Crosspoint general partner Bob Hoff.

Novell Chairman Ray Noorda would reportedly join Serius' board once the financing is in place. Serius declined comment on the impending investment.

Novell often invests in smaller outfits working with key technologies. It later buys some of the companies outright, absorbing their personnel and expertise. For example, in October 1990, Indisy Corp., which had been 60% owned by Novell, was bought outright. In recent years, Novell has filled technology gaps by acquiring Softcraft, Santa Clara Systems, CXI and Excelan.

In addition, Novell already has a close relationship with Borland International, Inc., a Scotts Valley, Calif.-based software vendor in the forefront of using object-oriented programming to create its own products.

It also markets Objectvision, an object-oriented package that assists users in developing their own applications.

Novell is also working on its own object-oriented software. It

demonstrated an object-oriented software management application for developers in March [CW, April 1]. According to several who saw the unnamed product, the application will monitor, diagnose and control disparate programs running on Netware. The company has also said it intends to give Netware Version 3.2, now under development, an object-oriented spin.

Strategic software tool

Network managers and industry analysts agreed that object-oriented software will become a strategic tool for programmers and systems administrators during the next few years. Already in use by some software vendors, object-oriented applications hold the promise of redefining networking for users in the same way that Microsoft's Windows made desktop computing more user-friendly, according to industry observers.

Object-oriented software is a kind of programming shorthand in which code for commonly used commands and functions is pre-packaged and represented by icons that can be placed within larger applications.

The same principles would apply to network management software, in which items on networks would already be defined on a list. Managers could add or subtract icons representing specific file servers, cables, applications and even individual users from the network as the network changes.

Systems administrators said they would like to have an object-oriented management application that would automatically configure networks and their components as they are changed.

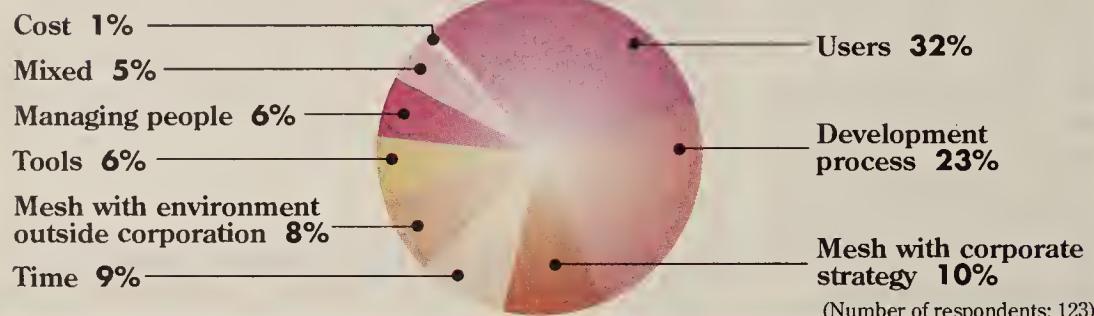
TRENDS

Software development

Senior IS managers and CIOs agree that better management and more attention to end users are solutions to the most troublesome development difficulties.



CIOs have least control over these aspects of software development:

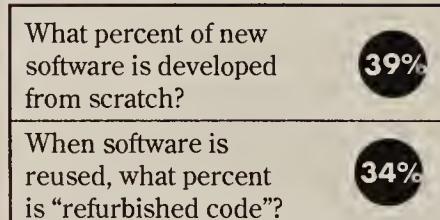


Top 5 causes of major software development difficulty:

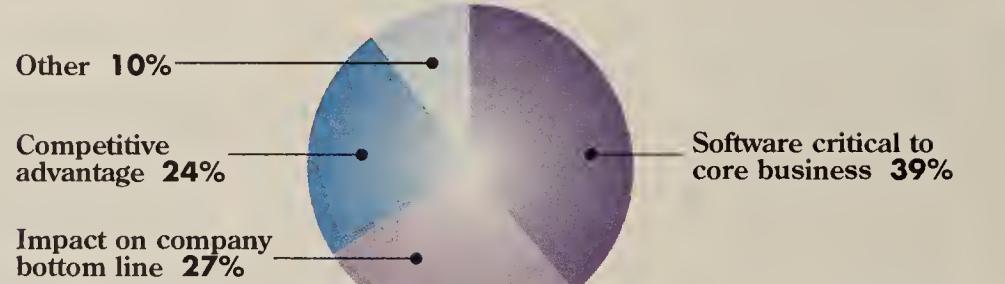
| | |
|------------------------------------|---|
| Management/People difficulties | 1 |
| Specification/Design | 2 |
| Corporate intervention/Instability | 3 |
| Development process | 4 |
| Target audience | 5 |

Ranked by the frequency of No. 1 mentions
Total responses: 133

Code reuse



Justifications for software development



Respondent base: 123
Total responses: 204
(Multiple responses allowed)

Source: The Yankee Group, Boston, Mass.

CW Chart: Janell Genovese

NEXT WEEK

Mitchell Kapor — founder of Lotus and On Technology and designer of 1-2-3 — has turned his sights to computer users' civil rights and liberties. While serious about user rights, Kapor, who counts Groucho Marx among his influences, finds time to pal around with On Technology's mascot. Look for In Depth's exclusive interview next week.



Client/server computing is fast becoming a standard in many commercial systems integrators' services lineups. In next week's Integration Strategies, IS managers who are moving their companies to the client/server model of computing talk about why they hired an integrator and the reasons they are moving to client/server computing.

INSIDE LINES

ACE'd out by IPO

Software developers involved with the Advanced Computing Environment were saying last week that The Santa Cruz Operation's Open Desktop for ACE has slipped at least six months behind its delivery schedule. It will show up at the end of 1992 rather than midyear, according to a report in "Unigram-X," a weekly newsletter for the Unix community. A developer's "snapshot" of the operating system will reportedly be out as scheduled next month. SCO is rumored to be preparing an initial public offering and is therefore focusing more on its short-term interests with Intel than the longer term promise of ACE.

Coming through

Software AG of North America is expected to deliver next week on promises it made in October 1990, when it announced its Entire client/server strategy. The idea is to provide applications development tools for clients — including Unix, DOS and OS/2 — and servers — including IBM mainframes and DEC machines — with any-to-any connectivity among the supported platforms.

Davy Jones' locker

Think that Peter Benchley monsters and the Titanic are the only things that emerge from the ocean's depths? Think again: Electronic Data Systems said last week that it will go forward with its annual Jason project broadcast — notwithstanding the fact that the project's entire complement of electronic equipment was lost late last month when the barge carrying it sank in the Pacific Ocean. A network of technology gathered by EDS and volunteered by other firms that rushed to Jason's aid will substitute for the compressed video equipment that remains in Davy Jones' locker, an EDS spokeswoman said. Jason beams scientific data from the Galapagos Islands to children across the U.S.

Back to the future?

Novell's Netware won't be alone when it gets bundled into the new Next Computer workstation. Next is also wrapping Apple's Appleshare software into Nextstep Version 3.0, scheduled for the first quarter of next year. This is ironic, given that Next Founder Steve Jobs also founded Apple. The more things change, the more they stay the same.

Staying put

No truth to the talk that Microsoft President Mike Hallman may be on his way out after unloading 93% of his stock in the company in October. Analysts still give a thumbs-up to the quiet and businesslike Hallman, who continues to lead the explosive growth of the Redmond, Wash.-based firm. "The one thing [Microsoft CEO] Bill Gates has done, which a lot of other software companies haven't, is find himself great people to operate the day-to-day business," one analyst said. One only has to look as far as the revolving door on the executive suite at Lotus to realize the truth of those words.

Loafers need not apply

The Boston Computer Society is looking for a new top dog, following the resignation of Terry Licklider. He'll remain on the board, but two years overseeing operations at what is reportedly the oldest and largest computer club in the U.S. is too taxing. "It's a fascinating job but takes up too much time," said Licklider, who added that he wants to spend more time with his 4-year-old son, described as "an avid computer user." The 12-year-old society now boasts 28,000 members, divided into 57 special-interest groups. Society directors have formed a committee to find a new president.

There is a "new breed" of hardware viruses on the loose designed to "blow up computers," according to Winn Schwartau, executive director of Inter.Pact, a consulting company based in Nashville. One virus upsets the timing of I/O chips, causing them to overheat and shut down. A second causes the head in a hard disk to chatter in the read or write modes, thus damaging the disk. Current antivirus techniques are ineffective against these viruses, Schwartau said. News Editor Alan Alper is always looking for new viral strains. Phone him at (800) 343-6474, fax him at (508) 875-8931 or Compuserve him at 76537,2413.

**Trade up to
IRMAtrac and
save up to
\$445.**



Sometimes you just need
a flexible board

IRMAtrac. The most flexible token-ring board in the world.

Within the myriad of connectivity options, you need to choose the path or paths that will protect your investment both now and in the future. Which is why we developed IRMAtrac,TM our new, highly flexible token-ring board. IRMAtrac Token-Ring Adapter/Convertible is designed to adapt in three different ways, to cover all of the token-ring growth possibilities that face you.

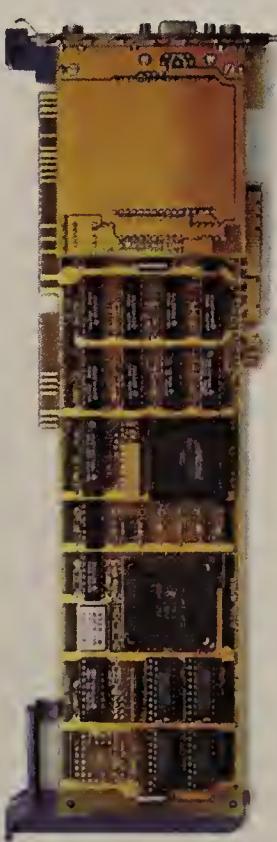
Whether you're moving from shielded twisted pair to unshielded twisted pair, 4 to 16 Mbps, or the standard PC environment to the Micro Channel[®] world of PS/2,[®] IRMAtrac's flexible architecture handles all of these environments on the same board.

That way, you can select the path that's right for your business, all the while enjoying the kind of reliability and IBM[®]-compatibility that make DCA's IRMATM products so highly successful.

Yet our appeal doesn't stop at flexibility. IRMAtrac offers better performance due to on-board intelligence and bus-master technology.

And we're compatible with Novell[®] NetWare[®] 286 and 386, IBM PCLAN Program, Microsoft[®] LAN Manager, and others. We've even carried this unparalleled flexibility to the Mac[®] with MacIRMAtrac.TM And the RIMs are interchangeable between boards, giving you a single source for support and upgrades.

What's more, until Dec. 31, 1991, you can trade up to IRMAtrac and get a credit of up to \$445 for your old coax or LAN adapters. For more information contact your DCA dealer or call 1-800-348-DCA-1 ext.69E. Because now more than ever, it's sure to be the most flexible offer you'll find.



DCA





The most UNIX® RDBMS licenses worldwide.

Informix has over half a million installed UNIX licenses. That's more than Sybase. ASK/Ingres. Even Oracle.

Why do so many companies rely on Informix software to manage their critical data?

► **Expertise.** If you're under the gun to implement data management solutions—start-to-finish—Informix has all the pieces you need.

- INFORMIX-OnLine is the database server of choice for demonstrating UNIX performance.

- More people use applications built with INFORMIX-4GL than any other UNIX DBMS development tool.

- INFORMIX-SQL was recently voted "#1 DBMS for Multiple Environments" by readers of Government Computer News.

- Informix is one of the only database companies with a language for developing GUI decision support applications.

► **Investment Protection.** Your needs are going to grow and change. Technology will continue to evolve. That's why Informix is committed to future transparent migration. We want you to know that whatever the source of change—new technology on our part, or business changes on yours—we're protecting your investment.

► **Partnership.** In addition to the many companies who use Informix to develop in-house applications, thousands of VARs sell vertical applications they've written on Informix. Dozens of computer manufacturers sell Informix as a key component of client/server solutions. And systems integrators worldwide use Informix products to build custom applications for their clients.

► **Experience.** The track record speaks for itself. We've been developing DBMS software on UNIX for UNIX for over a decade. In fact, Informix was selling open systems solutions long before others were even thinking about it. Today, our products are helping to define client/server computing in the 90s—and beyond.

► **The Big Picture.** If you're even thinking about UNIX for data management, you should be talking to Informix.

Call us toll free: **1-800-688-IFMX.**

 **INFORMIX®**

Information management
for open systems.